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DISTRICT ROHTAK, HARYANA, INDIA

2006-2008

EDITED BY
Vasant Shinde, Toshiki Osada and Manmohan Kumar



Indus Project, Research Institute for Humanity and Nature, Kyoto, Japan

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FOREWORDS

BY TOSHIKI OSADA
PROFESSOR, RESEARCH INSTITUTE FOR HUMANITY AND NATURE
LEADER OF THE INDUS PROJECT

It is my pleasure to publish the final report of excavation at Farmana, Haryana, India. This is one of the major outcomes of our research project, officially entitled "Environmental change and the Indus civilization", at Research Institute for Humanity and Nature (RIHN), Kyoto, Japan. The full research phase of our project started in April 2007 and will be concluded in March 2012.

The project examines the social character and environmental context of the Indus civilization, and attempts to determine how they are related to the civilization's short life and rapid decline. In particular, we aim to evaluate the impact of environmental change on the subsistence economy and trade network that sustained the Indus civilization's urban system. Our research also provides data on the long-term processes of climate change in South Asia. Such data helps us develop historical perspective on, and practical understanding of, contemporary environmental problems in the region.

Our project is divided into five research groups: (1) the Palaeo-Environmental Research Group (PERG); (2) the Material Culture Research Group (MCRG); (3) the Subsistence System Research Group (SSRG); (4) the Inherited Culture Research Group (ICRG); and (5) the DNA Research Group (DNAG). The excavations were conducted mainly by MCRG. In the initial stage we had a plan to excavate three sites; i.e., Farmana in the Ghaggar region (Haryana, India), Ganweriwala in the Cholistan desert region (Punjab. Pakistan) and Kanmer in the Kachchh coastal region (Gujarat, India). We, however, abandoned the plan of excavating at Ganweriwala due to the precarious political situation in Pakistan.

The excavation at Farmana was conducted by Professor Vasant Shinde (Deccan College, Pune, Maharashtra, India) in collaboration with Professor Manmohan Kumar (Maharshi Dayanand University, Rohtak, Haryana, India) and several members of our project. It was carried out during the three seasons: 2006-2007, 2007-2008 and 2008-2009. The previous reports on these excavations published from RIHN are as follows:

Vasant Shinde, Toshiki Osada, M.M. Sharma, Akinori Uesugi, Takao Uno, Hideaki Maemoku, Prabodh Shirvalkar, Shweta Sinha Deshpande, Amol Kulkarni, Amrita Sarkar, Anjana Reddy, Vinay Rao and Vivek Dangi (2008). 'Exploration in the Ghaggar Basin and excavations at Girawad, Farmana (Rohtak District) and Mitathal (Bhiwani District), Haryana, India.' *Occasional Paper* 3: 77-158. (Reprinted in Toshiki Osada and Akinori Uesugi (eds.) (2010). *Current Studies on the Indus civilization*. Delhi: Manohar. pp. 77-158.)

Vasant Shinde, Toshiki Osada, Akinori Uesugi and Manmohan Kumar (2008). 'A report on excavations at Farmana 2007-08.' *Occasional Paper* 6.

The principal excavator was Professor Shinde, but many other researchers were also involved in the excavation. Among them, the scholars listed below have made a contribution to this report:

Akinori Uesugi (Research Institute for Humanity and Nature)
Hitoshi Endo (Research Institute for Humanity and Nature)
Ayumu Konasukawa (Deccan College)
Takekazu Nagae (University of Toyama)
Steven A. Weber (Washington State University Vancouver)
Arunima Kashyap (Washington State University Vancouver)
Laura Mounce (Washington State University Vancouver)
Shinji Sugiyama (Paleo-environment Research Co., Ltd)
Paleo-Labo AMS Daring Group

The main aim of this report is to provide basic data on artifacts and structures found at the site to archaeologists and researchers of other fields, as well as general readers who are interested in the Indus civilization. Each section of the report was written by several contributors who are responsible for their data and analysis. I, as a chief editor, have decided not to change the contents of texts provided by the contributors, although I sometimes found descriptions which are not consistent with the ones in other parts of the report. Further analysis and scrutiny of data will probably be required, and the interpretation of such analysis will hopefully be discussed in academic journals in the future.

We also gratefully acknowledge assistance from the following people. They supported our excavation works at various stages.

Dr. R.S. Bisht (Archaeological Survey of India)
Dr. R.S. Fonia (Archaeological Survey of India)
Dr. V.N. Prabhakar (Archaeological Survey of India)
Dr. V.H. Sonawane (Maharaja Sayajirao University of Baroda)
Dr. Kuldeep K. Bhan (Maharaja Sayajirao University of Baroda)
Dr. P. Ajithprasad (Maharaja Sayajirao University of Baroda)
Dr. K. Krishnan (Maharaja Sayajirao University of Baroda)
Dr. J.M. Kenoyer (University of Wisconsin-Madison)
Dr. R.W. Law (University of Wisconsin-Madison)
Ms. Katie Lindstrom (University of Wisconsin-Madison)
Dr. Gregg Jamison (University of Wisconsin-Madison)
Dr. Asko Parpola (Professor Emeritus, Helsinki University)
Dr. Marta Ameri (State University of New York)
Dr. Haruhisa Mifune (University of Toyama)
Dr. Yasuji Shimizu (Archaeological Institute of Kashihara)
Dr. Taisuke Aoyagi (Archaeological Institute of Kashihara)
Dr. Manabu Koiso (Kobe Shukugawa Gakuin University)

Last but not least, I would like to convey my gratitude to Dr. Uesugi for his painstaking effort to make this publication of such a fine quality.

PREFACE

by Vasant Shinde
Professor of Deccan College, the Post-Graduate and Research Institute, Pune, India
Chief Director of the Excavation

As a part of the Indus Project of the Research Institute of Humanity and Nature, Japan, the project entitled Climate and Culture: An Interdisciplinary Approach to the Harappan Archaeology in the Ghaggar Basin was initiated in 2006. As a part of the study of the Harappan Culture, extensive and intensive archaeological survey was initiated to discover new sites and study already known sites in the Ghaggar Basin and some potential locations were selected for the collection of samples for climate reconstruction. Three sites were initially selected for excavation, namely Girawad, Farmana (Rohtak District) and Mitathal (Bhiwani District) in the state of Haryana. This was the work of a reconnaissance nature to identify potential site for further large-scale work. The site of Farmana, an extensive site that has both Early Harappan and Mature Harappan despoties, was found suitable for large-scale work. Such a site allowed for the study of both the socio-economic aspects as well as the evolution of Urban Harappan features from their formative stage. It is believed that climate played an important role in the growth of urban life in the middle of third millennium BCE, but until now we have hardly any data to substantiate this view. The earlier works on Holocene climate reconstruction conducted by Gurdeep Singh and D.P. Agrawal in 1970's and the subsequent work by Enzel *et al*. in 1990's are replete with problems. The data produced by these studies is contradictory and inconclusive. It was therefore decided to rexamine the connection between climate and Harappan culture process by generating new data on Holocene climate conditions. Professor Maemoku from the University of Hiroshima, Japan has undertaken this herculean task as a part of this project. The results of this work will have numerous implications for scholars interested in the growth and decline of this great civilization of the Indian Subcontinent.

The earliest level at Farmana contains material associated with the Regional Hakra Culture, which I refer to as the Early Harappan for the simple reason that the subsequent Mature Harappan phase is derived from it. Excavations carried out in the first season (2006-07) at the site of Farmana revealed a detailed architectural sequences beginning with pit-dwellings in the Early Harappan levels, which gradually transform into rectangular mud-brick structures, complexes and in the upper-most levels a well-planned Mature Harappan settlement. The Mature Harappan at the site is sub-divided into Period-IIA, IIB and IIC on the basis of stratigraphy and burials. The growth of the planned settlement began in Period-IIA and by Period-IIB Farmana developed into a fully-fledged town. The ceramic assemblages developed by the early settlers at the site remained in use throughout all of the sub-phases of the Mature Harappan period alongside typical Harappan ceramic assemblages. The second season's (2007-08) excavations were mainly confined to the uppermost level in the central part of the site, belonging to Period IIB. Most of Period-IIC's deposit has not survived as it has been removed in the process of ploughing. In a large horizontal exposure at Locality 1, an extensive portion of Period-IIB's planned town was unearthed. The excavated structural remains include a main street, two small streets and three extensive multi-roomed complexes.

Two of the most striking finds from Farmana's 2007-08 season include one steatite seal bearing a Zebu

bull with prominent dewlap and Harappan inscription and a large terracotta amulet stamped with unicorn and Harappan signs. Other important finds include a copper dagger and an etched carnelian bead similar to one recovered from the site of Ur in Mesopotamia. A Harappan cemetery was found at a distance of 900 m to the northwest of the site. Excavations in this area revealed three types of burial customs at Farmana- primary, secondary and symbolic. All burial types includde numerous grave goods, such as pots and jewellery.

The third season (2008-09) was devoted to excavating a number of index trenches, exposing more of the Period-IIB structural complexes which had been revealed during the previous season (2007-08), uncovering structural remains of Period- IIA, and excavating large area of the Harappan Cemetery. The index trenches revealed that the Early Harappan (Period-I) occupation at the site was confined to the north, west and central part of the site. A gradual transition from the structural remains in Period-I to those from Period-II is clearly visible in the stratigraphy. A large area of the Period-IIA was excavated to the north and east of Locality-1. The structural remains that were uncovered clearly suggest that the inhabitants of Farmana followed a typical northwest-southeast parallelogram town plan in Period- IIA and continued in Period-IIB. The structural remains of Period-IIA consist of two small streets, a number of complexes on either side of these streets, bathing platforms and drainage accomodations. Noteworty finds from this level one unicorn seal and a couple of copper axes. An equally extensive area of Period-IIB was also excavated. Besides locating the extensions of Structural Complexes 3 and 4 (which had been partially excavated in the second season), three more complexes were exposed. The result is an enormous body of data on town planning at Farmana, enabling a reconstruction of the socio-economic organization of the Harappans in the Ghaggar Basin. During this season, one large steatite unicorn seal from one of the rooms of the Structural Complex 5 was discovered.

The primary objective of the third season (2008-09) was the extensive excavation of the cemetery located 900 m northwest of the site. An central area of 35 m by 30 m was cleared for excavation, exposing 70 burials. Most of the burials consisted of rectangular pits, some of which were lined with clay. The skeletal remains were placed inside the pits so that the deceased's head was oriented to the north. In all, three types of burial- primary, secondary and symbolic- were practiced at the site with remains oriented in the Northwest-Southeast, North-South or Northeast- Southwest direction. All burials correspond to the entire span of the Mature Harappan period. Grave goods include pots and jewellery (such as beads, bangles, ear-rings, etc.). Burial data contributes greatly to our understanding of the social and economic conditions of the Harappan people. In the near future we plan to undertake DNA, strontium and diet studies of the skeletal remains, contributing to our understanding of Farmana's demographics, it's population's relationship with neighboring sites, their health, and subsistence patterns. We hope that these studies will contribute new facets to our understanding of Mature Harappan culture.

The Indus Team is grateful to the Archaeological Survey of India and the Haryana State Department of Archaeology for permission to carry out research at the site of Farmana. We are also grateful to the authorities of Deccan College, Post-Graduate and Research Institute, Pune, India, Research Institute for Humanity and Nature, Kyoto, Japan and Maharshi Dayanand University, Rohtak, India for their support and encouragement. The authors also sincerely thank the following individuals for visiting the excavation and helping us in many ways. They are Dr. G. B. Deglurkar, President, Deccan College, Deemed University, Mr. Dahia, Senior Reporter of the daily newspaper Dainik Bhaskar Mrs. Meena Mandal, Hon'ble Minister for Culture, Government of Haryana in 2008-09, Shri K.N. Shrivastava, then Director General, Archaeological Survey of India, Drs. B.R. Mani and R.S. Fonia, Joint Director General and Director of Exploration and Excavation respectively, Archaeological Survey of India, Dr. Rakesh Tewari, Director, U.P. State Department of Archaeology, Dr. Sengar, Director, Institute of

Archaeology, Archaeological Survey of India, Dr. Dhoop Singh and Dr. R. Shastri, officers of the Haryana State Department of Archaeology, late Prof. Suraj Bhan, formerly of the Department of Archaeology, Kurukshetra University, Prof. Amar Singh, Department of History, M.D. University, Prof. R.C. Thakran, Department of History, Delhi University, Ms. Minja Yang, Director, UNESCO Office in Delhi and her team, Dr. Y. Alone, Department of Fine Arts, JNU, Officers of GAIL, Ms. Somini Sengupta, Senior Correspondent, New York Times and host of others. We are thankful to Shri K.N. Shrivastava, the then Director- General, Archaeological Survey of India and Ms Minja Yang, the Director, UNESCO office in New Delhi who proposed considering the site for World Heritage status.

The large-scale excavation work was carried out successfully only due to the active participation of a number of individuals including Akinori Uesugi, Nilesh, Amol, Jyotiram, Prabodh, Gauri, Amrita, Shweta, Sharada, Vivek, Vihang, Vikas, Rajiv, Rajesh, Narender, Soumi, Kanchani, Shantanu, Vishwasrao, Takao Uno, Hideaki Maemoku, Hirofumi Teramura, Yasuhisa Kondo, Hiroshi Yamaguchi, K. Malap, Neha, Arti, and Astha. M.D. Kajale, P.P. Joglekar, Naruya Saito, Veena Mushreef, Arti Deshpande, Abhijit Dandekar, Sachin Joshi, Steven Weber and Arunima Kashyap visited the site for specialized studies. Mr. Ranbir Singh and his son Jitender of the Farmana village provided a house in the village to accommodate us and our equipment and helped us overcome difficulties at every stage. The Indus Team is grateful to all these individuals for their co-operation and active support to this project. We also thankfully acknowledge the support of the local people in the excavation operation and Mr. Amit for providing transportation during the course of the excavation. Last but not least, we would like to thank profusely Mr. Adam Green from New York University, USA for painstakingly editing and critically evaluating this manuscript.

CHAPTER 1

INTRODUCTION

BY VASANT SHINDE

The discovery of the Harappan Culture in the 1920's was hailed as the most significant archaeological find in the Indian Subcontinent, mainly because it filled in a major chronological gap between the Stone Age and the Early Iron Age of South Asia. Excavations at numerous Harappan sites like Harappa, Mohenjo-daro, Kalibangan, Lothal, Dholavira, Rakhigarhi, Kuntasi, etc. to name a few, have not only revealed numerous cultural characteristics of this important time period, but have also enabled the reconstruction of the Harappans' socio-economic organization. The partition of India and Pakistan in 1947 was a boon in disguise for Harappan studies in India. As almost all the known Harappan sites were now located in Pakistan, Indian archaeologists, particularly from the Archaeological Survey of India, a few from various State Departments of Archaeology and selected universities accepted the challenge to investigate the spatial and temporal extent of Harappan culture in Indian territory. Because of the efforts of numerous organizations and individual scholars, approximately 1000 sites have been discovered throughout India, twice the number of sites reported from Pakistan. We can place these sites on the archaeological map thanks to the hard work of scholars like Aurel Stein (1943), Katy Frenchman (1972), Rafique Mughal (in the Hakra region) (1997), A. Ghosh (1952), J.P. Joshi (1984), Suraj Bhan (1975), R.S. Bisht and the Departments of History and Archaeology of Universities of Kuruksheta and M.D. University, Rohtak and the Haryana State Department of Archaeology. A cursory glance at the distribution of Harappan sites in India reveals the highest number of Harappan sites in Haryana (350 sites), followed by Gujarat (230 sites), Punjab (147 sites), Uttar Pradesh (133 sites), Rajasthan (75 sites), Chandigarh (4 sites), Himachal Pradesh (3 sites), Delhi (1 site) and Jammu (1 site) (Reference).

The Ghaggar Basin, which covers parts of the Indian States of Punjab, Haryana and Rajasthan, has a thick cover of fertile alluvial soils, which is conducive to wheat and barley agriculture. In the past the main river Ghaggar and its major tributary Chautang were perennial. Additionally, its proximity to India's richest copper source, the Khetri belt in Rajasthan, made this region particularly attractive to settlers in the fourth millennium BCE. The richness of the region's agricultural resources undoubtedly made it an important breadbasket for the Harappans, who extensively occupied it in the coming centuries. As a result, over half of all known Harappan settlements were located in the Ghaggar-Hakra region. In addition to the the discovery of an extremely large number of Harappan sites, the work carried out by Rafique Mughal in the Hakra region and A. Ghosh, Suraj Bhan, Katy Frenchman, etc. in the Ghaggar region has brought to light some of the earliest phases of the Harappan culture. The discovery of cultures like Hakra in the Hakra basin and Sothi in the Ghaggar Basin, which flourished in the middle of fourth millennium BCE, were initially thought to be pre-Harappan in nature, but careful observation and subsequent analyses reveal that they made important contributions to the formative period of

the Harappan culture. These cultures therefore are now treated as the Early Harappan. The work carried out at sites like Kunal (Hissar District), Bhirrana (Fatehabad District), Girawad and Farmana (both in Rohtak District) in the state of Haryana reveals that the formation of the Mature Harappan built upon elements of the Early Harappan in this region. Many cultural traits, such as ceramic assemblages, developed during the Early Harappan and remained in use throughout the formation of the Mature Harappan period. As a result, the Mature Harappan phase that flourished in this region is slightly different from that at Harappa or Mohenjo-daro. Thus, the Ghaggar Basin was home to a regional manifestation of the Harappan culture.

The site of Farmana, spread over an area of 18 ha, is the second largest Harappan site in Haryana. It is surrounded by good arable land, and its surface has been subjected to ploughing for the past 50 years. As a result, a prominent archaeological mound has been reduced to a two meter bump. Had we not started archaeological research at the site it would have been completely razed by now, as the farmers were planning to convert it into an agriculture field. The natural degradation of the site, exacerbated by cultural factor, has resulted in the complete removal of Late Harappan, Painted Grey Ware and Early Historic Kushan period remains. Fortunately, part of Mature Harappan and the entire Early Harappan deposits were intact. It is because of this that the site was selected for large-scale excavation. The site of Farmana was excavated by the Indus Project team between 2006-07 and 2008-09 with the following broad objectives in mind:

1) *To establish the characteristic features of the Early Harappan cultures in the Ghaggar Basin and place them in proper chronological order:* As mentioned earlier, a number of cultures in the Ghaggar Basin flourished prior to the development of the Harappan Civilization, including the Regional Hakra Culture Tradition. The spatial and temporal extent of this culture needed to be established, especially in relation to the Harappan Civilization. This is possible at the site of Farmana as it has deposits from both cultures in proper stratigraphical context. Additionally, the characteristic features of the Early Harappan Regional Hakra Culture Tradition are yet to be properly understood, as no systematic work on this culture has been carried out. The site of Farmana is only the second to produce a discreet deposit belonging to the Regional Hakra Cultural Tradition, the first being Bhiranna, located 60 km to the northwest in the Fatehabad District. Farmana, excavated on a large scale, contributed a substantial body of new data, providing an opportunity to investigate structures, storage and cooking facilities, ceramic traditions, and other attributes of the material culture of these Early Harappan cultures.

2) *To establish characteristic features of the regional variations of the Harappan culture in the Ghaggar Basin:* The earlier belief that the Harappan Civilization was a single homogenous cultural entity has turned out to be a myth. Within different Harappan regions are found local manifestations or variations (domains according to Possehl 2002). The first scholar to point to this variation within the Harappan Civilization was J.P. Joshi (1984). Subsequently, Possehl (2002) has identified more than seven domains, separated by geography, settlement and subsistence patterns and material culture. The excavations at Rojdi by Possehl and Raval (1989) shed light on regional variation of the Harappan Civilization in Saurashtra. Excavators noticed that the material culture associated with the Harappan culture at Rojdi in Saurashtra was considerably different when compared to that found in the Sindh-Baluchistan region, termed by Possehl as "Sindhi Harappan Domain". These variations characterized Harappan settlements throughout the entire Saurashtra region. Thus the regional variant of the Harappan culture in

Saurashtra was termed "Sorath Harappan" (Possehl and Herman 1990). There are similar regional differences in material culture, particularly in the ceramic assemblages of Harappan sites in the Ghaggar Basin. Present research has tried to establish the characteristic features of the regional variations of the Harappan Culture in the Ghaggar Basin.

3) *To understand the causes and characteristic features of regional variations of the Harappan culture in the study area and the role of the Early Harappan cultures in the formation of Harappan elements:* There is a need to explain why variations have occurred in the material culture of the Harappan period in this area. A number of Early Harappan cultures flourished in various parts of the region that would become incorporated into the Harappan civilization and these early cultures contributed to the development of Harappan elements in each region. Naturally, the features of Early Harappan cultures persisted through the Mature phase in their respective regions (Shinde *et al.* 2006). In the Sindh-Baluchistan region the elements of the Early Harappan Amri-Kot Diji cultures dominated assemblages belonging to the Mature Harappan phase, whereas in the Ghaggar Basin the elements of the early Sothi-Siswal continued in the Mature Harappan phase. The so-called Sorath Harappan phase evolved out of the Padri Early Phase (Shinde 1998), hence the continuation of the Padri elements in the Harappan phases in Saurashtra. The present research seeks to explain the development of the Harappan elements in the Ghaggar Basin and study the contribution of Early Harappan cultures to the formation of the Harappan civilization and its regional variation in this region.

4) *To study town planning in the Mature Harappan phase from a socio-economic point of view:* In the central portions of the site the remains of the Mature Harappan phase have been well preserved. As this part of the site is likely to be destroyed by of agricultural activity in near future, it was decided to concentrate on excavating this area. As the area available is vast and structural remains are close to the surface, it was decide to conduct a large horizontal excavation, exposing many structures associated with the Mature Harappan phase, enabling the reconstruction of socio-economic aspects of the Harappan life.

5) *To generate more data to understand Harappan script and language:* In spite of a number of attempts throughout the last several decades, the Harappan script has not yet been deciphered. Recently, Steve Farmer, Richard Sproat and Michael Witzel (2004) even claimed that the Harappans were illiterate and that they did not have a proper script. New work that combines the efforts of archaeologists and linguists is needed to tackle this problem. With this goal in mind, one aim of the excavations at Farmana was to bring additional data on the Harappan script to light.

6) *To understand composition of the Harappan population, their health, diet and burial customs:* The Harappan cemetery which was detected and partially excavated in the second year of excavation (2007-08) has been excavated on a very large scale in the season of 2008-09. This was done in order to investigate some of the biological attributes of Farmana's people, including composition of population, and aspects of their health and diet. Such studies have not been conducted at other sites and hence will be an important contribution. Additionally, data from the cemetery at Farmana provide an important glimpse into Harappan burial customes.

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CHAPTER 2

SITE AND ITS ENVIRONS

BY VASANT SHINDE

1 LOCATION OF THE SITE

The ancient site of Farmana (29°02'22"N and 76°18'21"E) falls in the jurisdiction of three different villages- Farmana, Seman and Bhaini Chandrapal (Badi Bahen), all of which belong to the Meham block of the Rohtak district in the state of Haryana (Figures 2.1, 2.7 and 2.8). The site is locally known as Daksh Kheda. Since most of the site lies in the jurisdiction of Farmana village, it is considered a part of that village. It is 4 km to the west of Farmana village on the metal road to Semen. It is 2.5 km to the east of Semen. One can easily reach the site from any of the villages as there is frequent transportation service available between them. The ancient site of Farmana is surrounded by fertile agriculture land in the Chautang river basin, roughly 30 km from the river. There are also lakes in the vicinity of the site, though their age is unclear. The Harappans may have relied on such lakes for their water needs. Alternatively, the Harappans at Farmana may have dug wells for their water necessity; this is suggested from the presence of a few wedge-shaped burnt bricks (usually used for well construction) found on the surface of the site. While ploughing their fields, two of the owners of the site came across remains of at least two wells, one towards the southern and the other towards the western periphery of the site. The excavation at Farmana has yet to unearth a proper Harappan well. It is also impossible to preclude the possibility that a number of small streams surrounded the site. The recent survey carried out by a team of scientists from the Indian Space Research Organization (ISRO), Jodhpur has detected a network of palaeo-channels. All of this evidence suggests that in the past the region was well watered.

The initial survey of the site revealed that over 18 hectares of the site were extensively occupied (Shinde *et al.* 2008a-b). This makes Farmana the second largest Harappan site in Haryana, next only to the site of Rakhigarhi. Major portions of the site (especially along the periphery and upper levels of the Mature Harappan period) have been destroyed by modern cultivation. The central portion of the site, measuring approximately 80 m by 60 m, is relatively intact, whereas the peripheral area has been flattened to almost natural level due to agricultural activity (Figures 2.2 and 2.3). The total depth of the surviving habitation deposit varies from 2.5 m to 3.5 m.

The site is located on an elevated sand deposit. It was initially thought that this is a stabilized sand-dune form of wind activity. However, an observation by Geomorphologist Prof. H. Maemoku revealed that the deposit is made of alternate layers of river sand and silt. This indicates that the climate before the Harappan period was quite wet and that there was a river nearby (Prof. H. Maemoku, University of Hiroshima, Japan, personal communication).

The central area of the site, which is relatively intact, has an Early Harappan (Regional Hakra Culture Tradition) and Mature Harappan deposit whereas the flattened portion along the periphery has more Early Harappan material. Earlier explorers reported that in addtion to Early and Mature

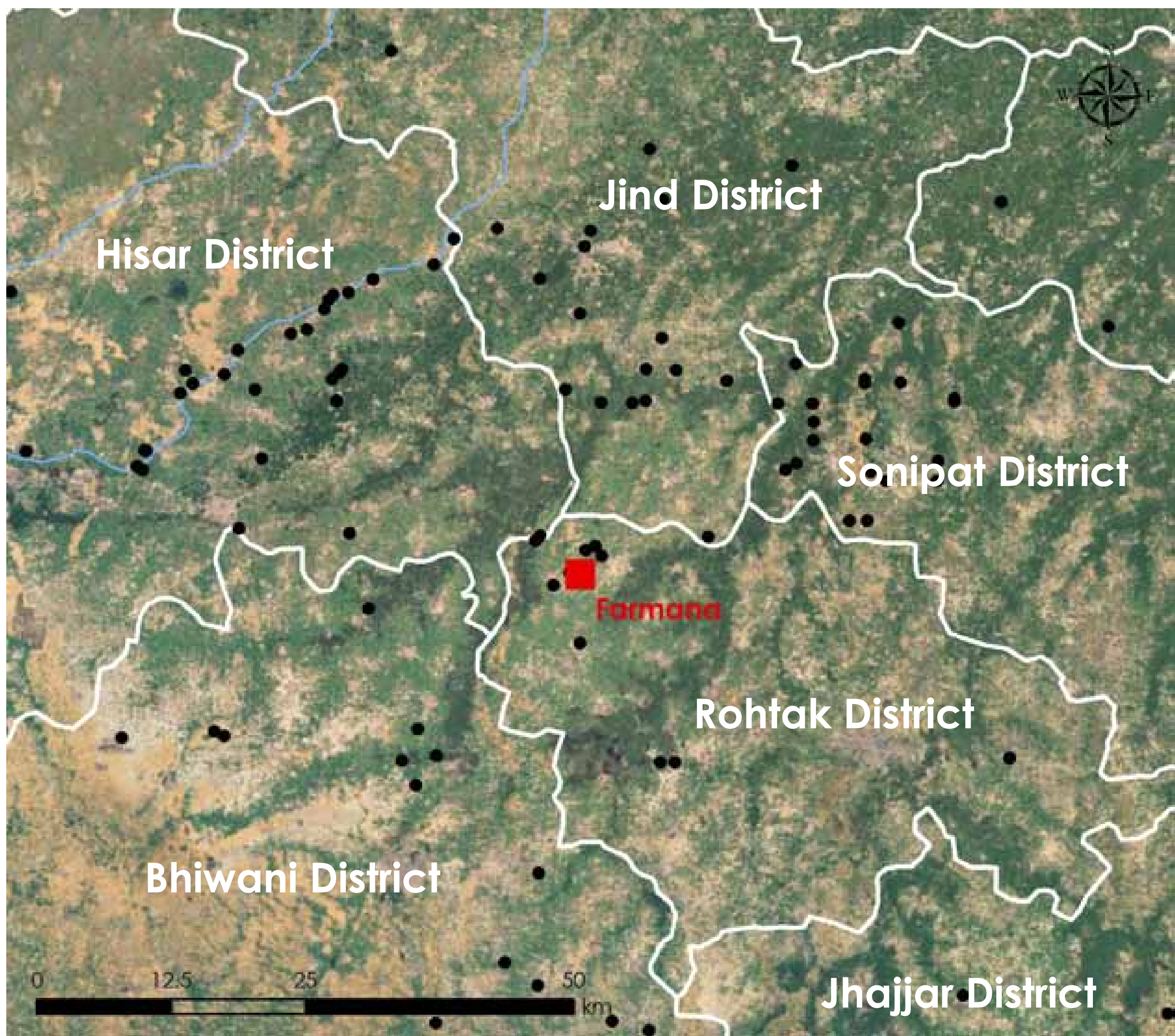


Figure 2.1 Location of the site of Farmana in Haryana

Harappan material, pottery from the Late Harappan phase, Painted Grey Ware culture and Early Historic Kushan levels was once on the surface of the site. Extensive damage along the periphery has precluded the possibility of tracing a fortification wall around the site, however it is unlikely that such a considerable large Harappan town lacked a fortification wall. The Early Harappan (Period-1) deposit at the site is intact without any destruction or disturbances. The Mature Harappan is represented by three sub-phases- Period-IIA (Early Mature), IIB (middle Mature) and IIC (late Mature). The site which was once a a prominent mound some 50 years ago has been subsequently reduced by farmers. In the process of converting the site into an agriculture land, the entire Early Historic, Painted Grey Ware, Late Harappan and part of the upper Mature Harappan (Period-IIB) were completely removed. In part as a result, the structural remains and features are found immediately below the ploughing zone. The site is therefore ideal for horizontal excavation.

In the catchment area of Farmana more than 20 satellite settlements have been reported. Half a dozen of them belong to the Harappan period. Notable among them are Bedwa and Putti Seman, both burial sites of the Late Harappan period. Considering the distance of these burial sites from Farmana, they are probably not be associated with it. Rather, it is likely that there existed another big Late Harappan settlement in the vicinity of the burials sites.

The site of Farmana, one of the most extensive and rich Harappan sites in Haryana, flourished



Figure 2.2 A view of the Farmana Archaeological site from the East



Figure 2.3 Extremely fertile arable land around the site of Farmana.

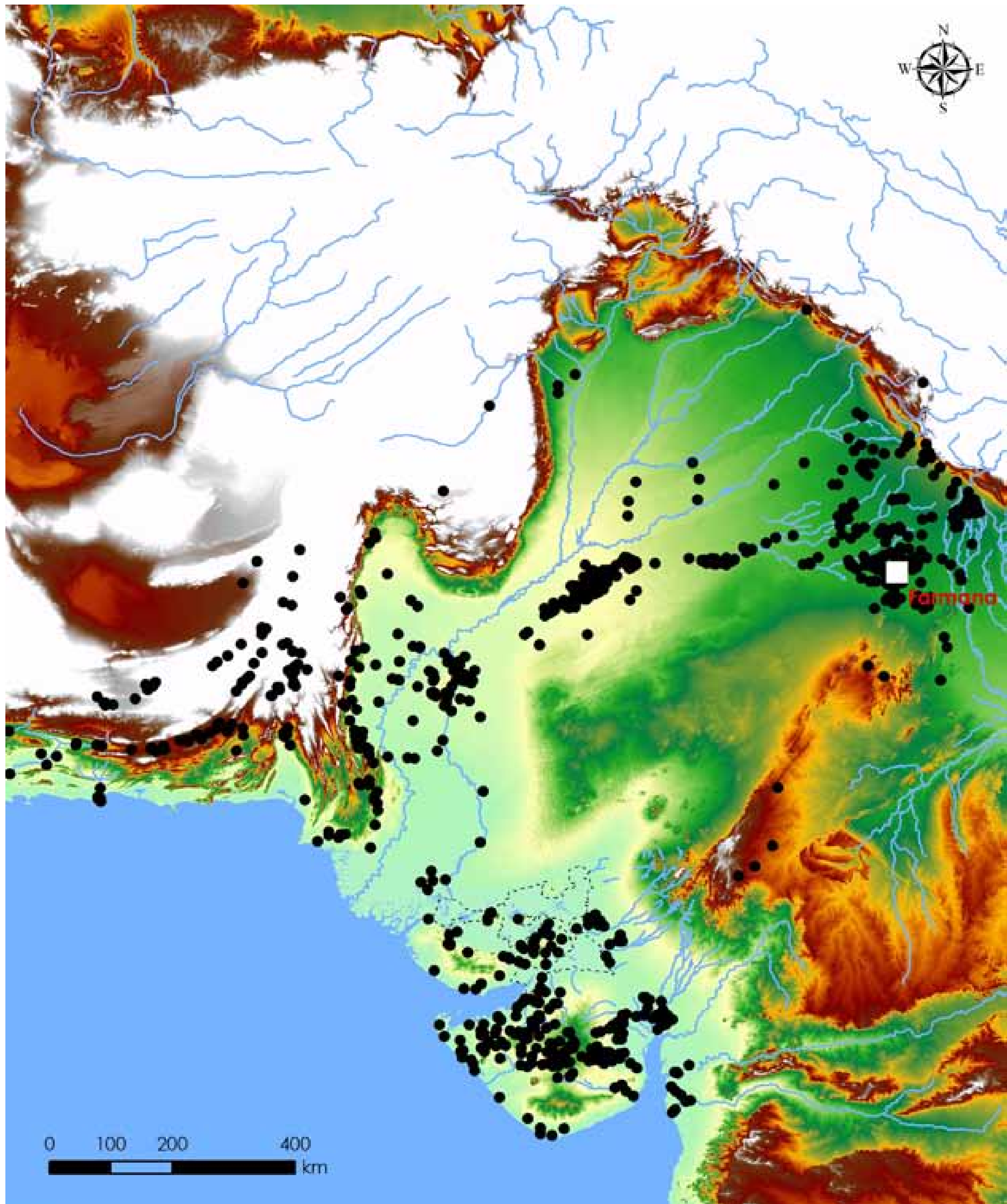


Figure 2.4 Distribution of the Harappan sites in the Indian Subcontinent.
Note heavy concentration of the sites in the Ghaggar-Hakra basin.

mainly because of the availability of very fertile nearby agriculture land (Figures 2.4 - 2.8), as well as sources of water in its immediate catchment area. It may have attained considerable importance because of its close proximity to the site of Rakhigarhi (40 km to its northwest) and due to its location on the trade route between rich mineral resouces in Rajasthan and the major city of Harappa in Punjab. It is likely that Farmana played a role in controlling this trade, making it a crucial player in the Harappan economy. The site is not near a major river, but is in the catchment area of river Chautang, a major tributary of the river Ghaggar. The water level in this area is quite high and every nearby present-day village has access

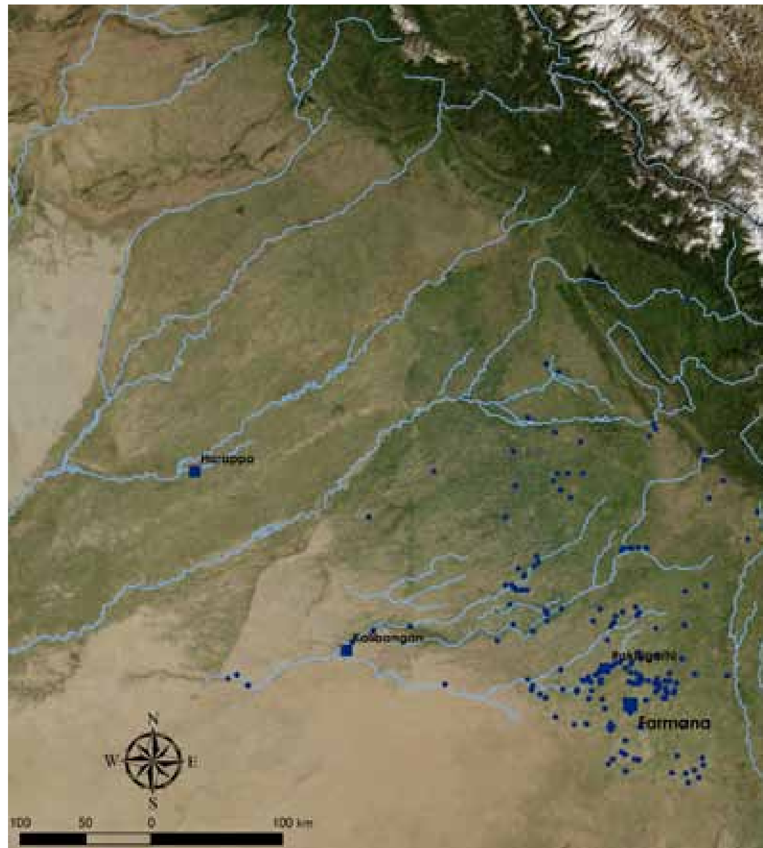


Figure 2.5 Satelite image of the Ghaggar and Punjab Plains

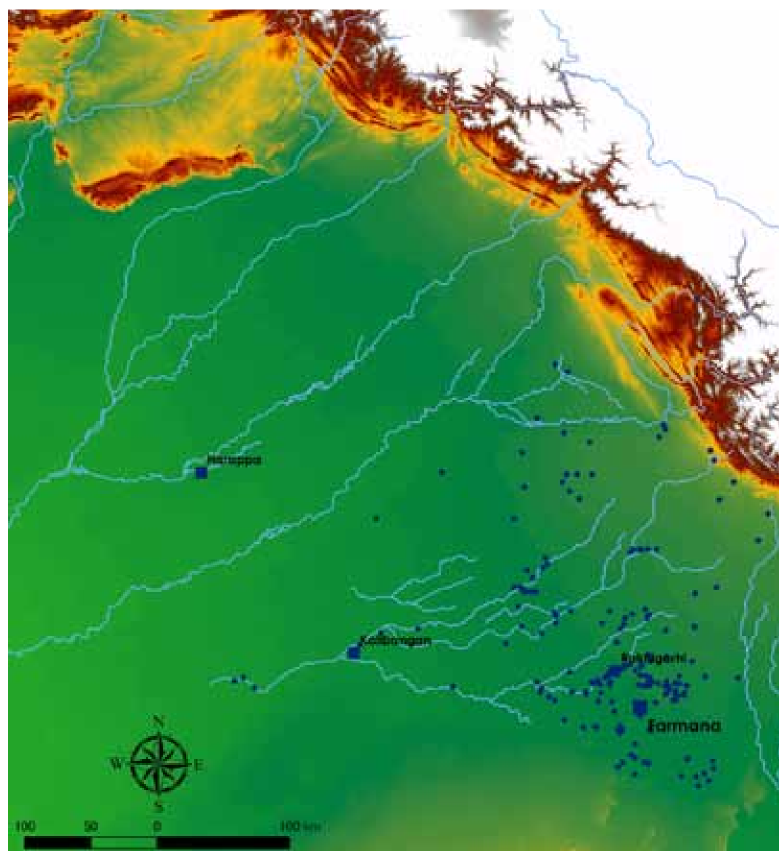


Figure 2.6 DEM image of the Ghaggar and Punjab Plains

to the Chautang and Ghaggar rivers, which have occasionally shifted their beds in Holocene times leaving inter-locked alluvial plains along its receding course [1]. The thickness of the alluvium deposit varies from 100 m to more than 400 m at places. Thus, hard rock geology of this area is concealed under alluvial and aeolian deposits.

The main physiographic units in this area are Chautang Flood plains and Aeolian plains. The relict courses of the river Chautang are filled with sediments, causing differences in the physiographic positions. Topographically, today the Chautang basin is a flat and monotonous upland plain. The crops supported by fertile soils left by the Chautang include the major Kharif crops (bajra, maize, jowar, cotton, rice and sugarcane) and the Rabi crops (wheat, gram, barley and mustard).

The Ghaggar River system (which also includes Chautang) emerges from lesser Himalayas and piedmonts and passes through the Indian states of Haryana and Rajasthan and then enters the Bahawalpur region of Pakistan. In central and southern Haryana, shifting channels of the Chautang have been identified between Ghaggar and Yamuna. The Chautang is a seasonal stream in its upper course. Though the Ghaggar and Chautang are dry now, were both important in the past mostly during the Early and Mature Harappan periods, as indicated by the heavy concentration of sites of that period (Figures 2.4 - 2.6).

The Chautang (very often identified as Rgvedic Drishdvati) was a major feeder to the Ghaggar (very often identified as Rgvedic Saraswati) in the past, probably until around 2000 BC. It rises in Siwaliks, close to Ghaggar, and they both flow parallel for some distance, the Chautang taking a more southerly course. It then turns west, passing Hissar and the well-known archaeological sites of Siswal, Sothi, Nohar and Rakhigarhi. It joins the Ghaggar near Suratgarh, where the Harappan site of Kalibangan and Early Historic site of Rang Mahal occupy places of prominence.

Recent studies of satellite imagery indicate the strong possibility that there were small streams close to the site of Farmana. Work carried out by scientists of the Indian Space Research Organization (ISRO), Jodhpur revealed a number of palaeo-channels by using IRS AWIFS data and Radar images. They have stated that the "northern and north-western districts of Haryana where occurrence of palaeo-channels has been observed on satellite images. The study area includes the districts of Yamuna Nagar, Kukukshetra, Jind, Hissar, Sirsa, Kaithal, Sonipat and Panipat. Confusing network of interlaced channels running NS and NE-SW is observed in these districts. Palaeo-channels mapped in the NW part of Haryana which are mostly continuous and long belong to the Ghaggar (Saraswati system) and those in the middle part of the State with disposition in the NE-SW direction seem to belong to the Drishadvati (Chautang) river system. Overlay of the litholog (sedimentological) data from the peizometer key wells maintained by the Ground Water Cell, Government of Haryana indicates three different sediment patterns in the studied area. Occurrence of Coarse sediments, including Gravel and Pebble in the foothills zone near Yamuna Nagar, occurrence of mostly medium sands in the middle zone, comprising of the districts of Kaithal, Karnal Panipat, Kurukshetra and the eastern part of Jind and mixed zone of coarse sand, gravel and pebbles in Hissar, Sirsa and the Western part of Jind districts. Overlay of archaeological sites on palaeo-channel shows alignment of many Harappan period sites in the region occupied by he Drashadvati river system" (Sharma *et al.* 2006).

The Ghaggar basin is very close to the Khetri copper belt of Rajasthan. It has been suggested by many that the Khetri belt of Rajasthan was one of the main sources of copper for the Chalcolithic and Harappan people. There are numerous sites of the Ganeshwar-Jodhpura Culture in and around the Khetri belt, which are contemporary to the Early



Figure 2.7 Map showing the location of Farmana and surrounding sites

to one or more man-made lakes or wells.

The Ghaggar river basin lies mostly in the states of Haryana and Rajasthan. The geological formation of the state of Haryana began during the Precambrian and continues into recent times. The Ghaggar river basin can be divided into the Aravalli system, Siwalik system and Alluvial plains. The Aravalli hills are the oldest formations, located to the south and west of the Chautang basin. They are composed of quartzite, quartzitic sandstone, mica schist and crystalline limestone. The Siwalik system is located to the northeast of the Chautang basin. The Siwaliks are primarily composed of sedimentary rocks. The Chautang plain formed as a result of the deposition of alluvial sediments. The whole expanse of the alluvial plain is crossed by relict channel belonging

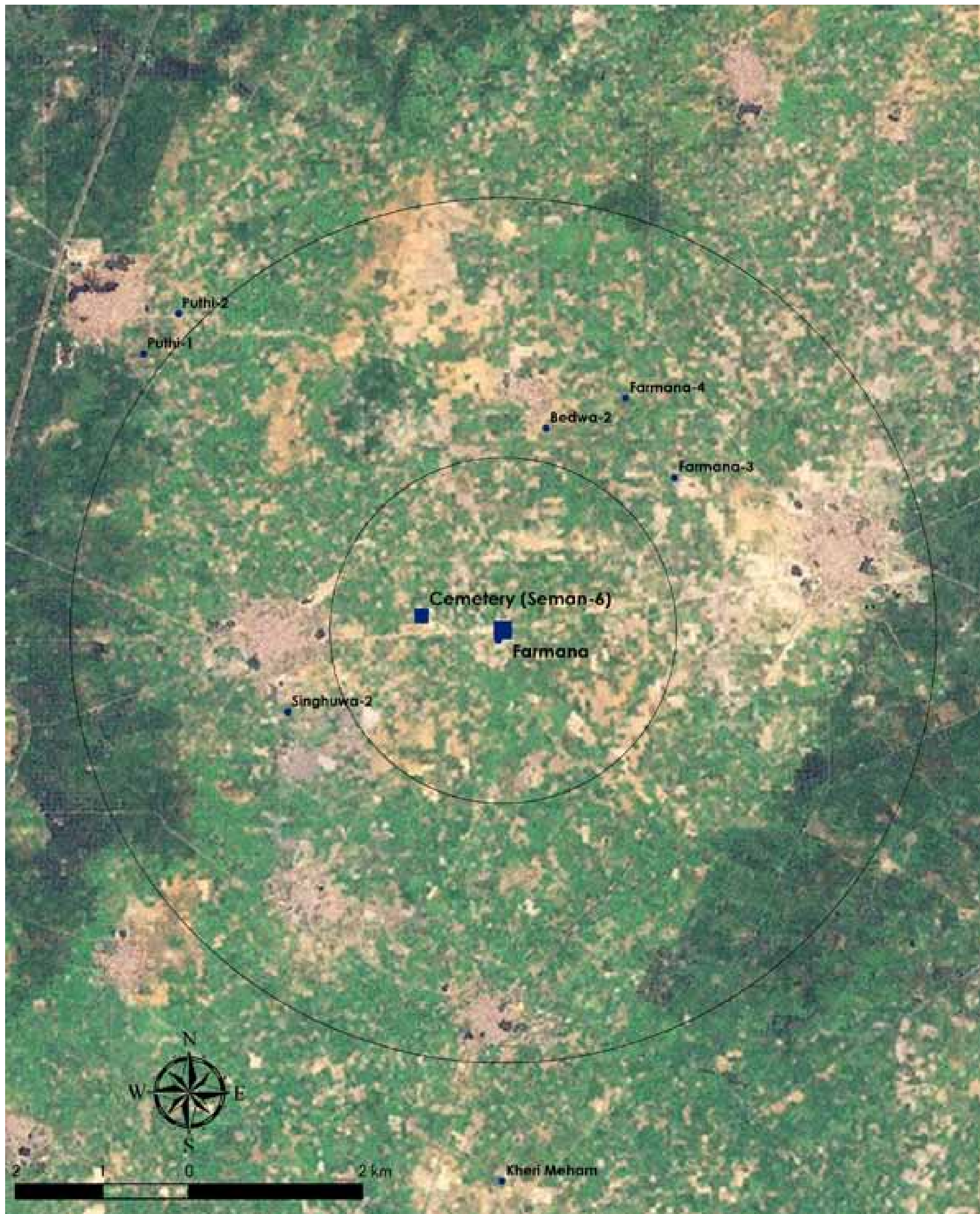


Figure 2.8 Map showing the location of Farmana and surrounding sites in its vicinity

and Mature Harappan phases. It has been suggested that the Ganeshwar-Jodhpura people controlled the copper sources. In addition to raw copper, the appearance of 'V'-shaped arrow-heads typical of those recovered from the type site of Ganeshwar at Farmana indicates that people from the Ganeshwar-Jodhpura culture also traded finish products to the Harappans. The two communities must have had cordial relations, as the Harappans obtained significant amounts of raw materials and finished products from their Neolithic-Chalcolithic neighbors. Since the site of Farmana is on the trade route to Harappa and Ganweriwala, it is quite likely that it played very important role in the hinterland trade between the major cities of the Harappan Civilization. From the above account it is clear that ecologically the Ghaggar was an

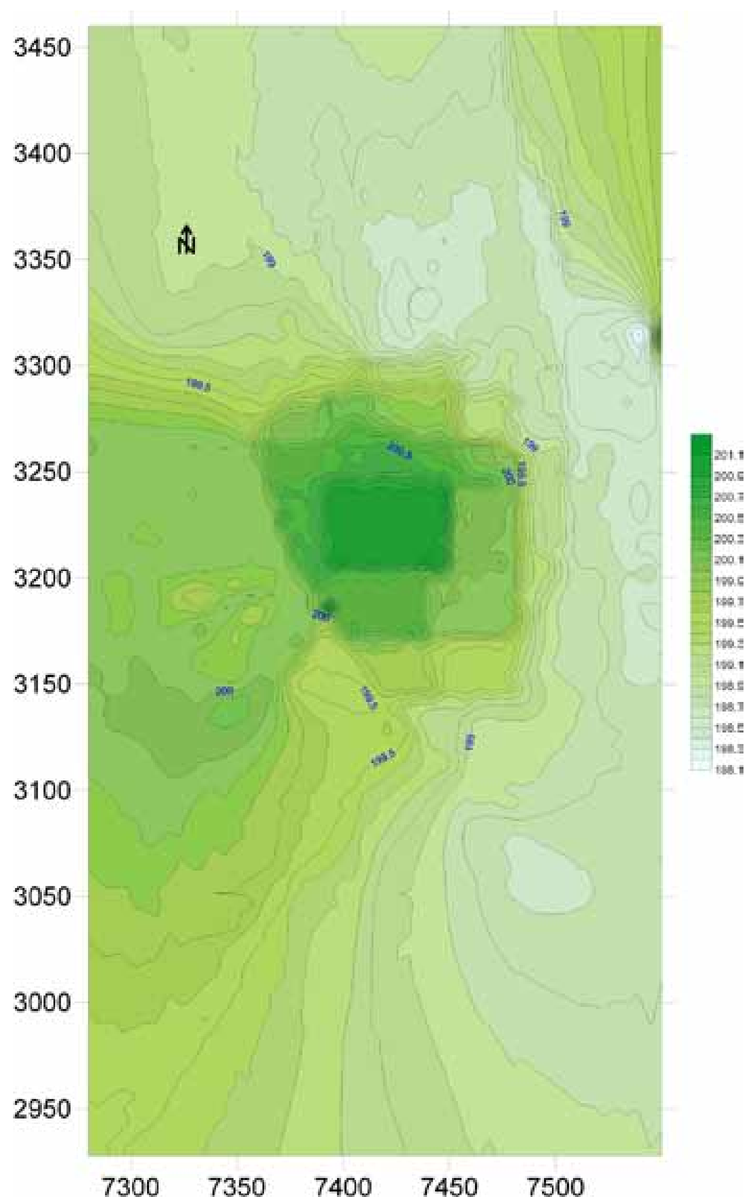


Figure 2.9 Contour plan of the Farmana site showing total habitation area

advantageous region for the Harappans, and many of its sites, such as Rakhigarhi, Kalibangan, Banawali and Farmana, developed into cities and towns.

2 THE MODERN VILLAGE OF FARMANA

The modern village Farmana is one of the largest in Meham Block of the Rohtak District, Haryana. It is located 10 km to the northeast of the town of Meham and 45 km to the east of the city of Rohtak, the District headquarters. The village has a population of over 5000 and a history of over 1200 years. There is a legend that Dhama, son of Pipa Singh Parmar who hails from Madya Pradesh, first came and settled the village around 865 AD. After establishing the settlement, Dhama handed over the responsibility of the security of the village to his relatives and went and settled at the village called Kelanga. The relatives of Dhama ruled the village for many generations and eventually the village came to be known to the Rajputs as Farmana. It is believed that Dhama was a strong-headed Rajput and took immense pride in issuing Farmans to the others. The meaning of Farman is order. Thus the village founded by the commanding

Dhama, was named Farmana.

One hundred and fifty years after its establishment, the Jat community arrived from Sivani. The first Jat to come to the village, flocks of animals in tow, was Baliya Manderana around 1350 AD. He was a shepherd by profession and used to take his as well as Parmar's animals for grazing. Recognizing and the utility of the services he was rendering, Parmars allowed him to live in their part of the village. He came to be considered the saviour of the village, as Allauddhin Khilji, the Delhi ruler at that time, decided to loot villages in Haryana. When his army came to loot the village Farmana, Baliya was the first to know. He made his animals run towards the village. The dust that rose when his animals started running towards the village gave the impression to the Allahuddhin army that a big force from the neighbouring areas is coming to save the village. Fearing defeat at the hands of the local villagers, the army ran away and the village was saved. Baliya was a hero.

In 1475, one hundred and twenty five years after the arrival of Baliya, the Saharan Jats arrived from Bhadang in Rajasthan and settled in a locality called Girodi Kheda. Shahajahan, the son of Mughal Emperor Jahangir, had accorded a special status to Farmana. He used to visit the village occasionally, stopping to issue Farmans (orders). The last time he visited this village was in 1714, when he issued an order that his son Dar Sikohi would be his nominee.

The village was divided into two major divisions-Farmana Khas and Farmana Badshahpur in 1879, however, today the entire village is known as 'Farmana'. The village is a home for many different social groups and craftsmen. Besides Jats, the village has a community of Brahmin (upper caste), Bania (traders), farmers, cobblers, oil traders, goldsmith, washer-men, lower caste people and Muslims. In the jurisdiction of the village are several old, elaborate wells made of burnt bricks and a few old temples. While the name of the village may be relatively recent, Farmana has a history.

3 ECOLOGICAL BACKGROUND OF THE SITE

The Ghaggar River basin lies mostly in the states of Haryana and Rajasthan. The Ghaggar basin includes subtropical, semi-arid to sub-humid, continental and monsoonal climate zones. Throughout much of its extent it experiences a prolonged hot period from March to October and fairly cool winters from November to March. The period from July to about mid-September is the southwest monsoon season. The natural vegetation found in the Ghaggar Basin includes tropical thorn forests, consisting of plants like Kikar, Jall, and beri. Common shrubs are Bans, Vanvar, Babhool, Mallah, Arir, Phoa, Khip and Ak. Some medicinal herbs like Bansa, Kharuti, Bhakhra and Dhattura are also found. The most important natural vegetation of the area are the grasses, such as Dhaman, used mainly as fodder. 'Chimber' or Khorimber, Kheri or Kur, Duchab, Duband Sarkanda are also fodder grasses that grow naturally on fallow lands.

The geology of Haryana is largely Precambrian. It is characterized by a number of distinct but interrelated formation systems, including the Aravallis, Siwaliks, and the alluvial plains. The Aravalli Hills are the oldest geological formation present, bordering the Chautang Basin to the south and west in Bhiwani, Mahendragarh and Gurgaon Districts. They are composed of quartzite, quartzitic sandstone, mica schist and crystalline limestone. The Siwalik system located to the northeast of the Chautang Basin is composed primarily of sedimentary rocks. The Chautang Plain developed through the deposition of alluvial sediments, including sand, silt and occasionally gravel beds. The alluvium completely covers the rock geology of the floor. The whole expanse of the alluvial plain is crossed by relict

channel beds from the Chautang and Ghaggar Rivers, which occasionally shifted their beds in Holocene times leaving interlocked alluvial plains along its receding course. These relict beds are now covered by aeolian deposits from the recent past. The thickness of the alluvium varies from 100 m to more than 400 m at places. The sediments are heterogeneous in character and are deposited on a basement of metamorphic and igneous rock of the pre-Cambrian age.

The soils of this area have been formed by Aeolian and fluvial processes. The main physiographic units comprising the soils in this area are Chautang Flood plains and Aeolian plains. The relict courses of the Chautang River filled with sediments over time, causing it to shift it's physiographic position many times. Topographically, the Chautang Basin is a flat, monotonous upland plain; the western portion of which marks a gradual transition to the Thar Desert.

The importance of agriculture to the economy of the region is apparent by the fact that more than 70 % of the people reside in the villages and almost 81.3 % of the total area is actually sown. There are two main crop seasons: the kharif (June - August to September - October) and rabi (October - November to April - May). The major kharif crops are bajara, maize, jowar, cotton, rice and sugarcane. Among the rabi crops wheat, gram, barley and mustard are notable. Wheat is the dominant crop in the region, comprising 36.3% of the total area under good grain cultivation. Next to wheat, gram occupies 16 % of the gross cultivated area. Other cereals such as barley are grown in the drier parts, and rice is produced in the wetter and water-logged areas. The next most important cereal is bajara, which is grown in the dry and sandy parts of southern Haryana. Jowar and maize, which are both cereal and fodder crops, are grown in the drier and wetter parts respectively. Jowar is found throughout the Haryana state excepting the district of Hissar. Cotton and sugarcane, both cash crops, have recently gained importance in the region.

Deforestation has almost driven the indigenous fauna and flora to extinction. Animals that once roamed this area in the recent past include the common langur, tiger, leopard, panther, cat, the small Indian civet, the common mongoose, jackal, Indian fox, and others. Striped palm squirrel or gilehary, sahi or the Indian porcupine, the Indian Gerbille, the common house mouse and rat are the most common small mammals found in Haryana. Chinkara or ravine deer, blackbuck and the blue-bull (nilgai) are also found. A large number of game birds, some of them residential, are found throughout the year, along with some winter migratory birds. Various types of ducks and geese are also found, including the eastern grey leg goose, bareheaded goose, Brahany duck, common shell duck, pintail, common tail, mallard, blue winged teal, shoveller, common pochard, ferruginous duck, tufted duck, comb duck, large whistling teal, tree duck, partridges, quails, Indian black partridge, grey partridges, Indian yellow legged buttonquail and Indian bustard quail are resident species. Sandgrouses, particularly the large pintail sandgrouse, spotted sandgruse, and the Imperial or blackbellied sandgrouse visit in the winter (Sachadev *et al.* 1995: 11).

4 GHAGGAR AND CHAUTANG RIVER BASINS

In the state of Haryana, all the rivers except the Yamuna are semi-perennial. The Ghaggar River system emerges from the lesser Himalayas and piedmonts, passing through the Indian states of Haryana and Rajasthan and then entering the Bahawalpur region of Pakistan. Upon entering Pakistan, the Ghaggar River becomes the Hakra. In the rainy season, the Ghaggar River flows up to Hanumangarh, for a distance of about 465 km from its source. In central and southern Haryana, shifting channels from the Chautang have been identified between the Ghaggar and the

Yamuna. The Chautang, a major tributary of the Ghaggar, is also a seasonal stream in its upper course. We believe that the Ghaggar and Chautang Rivers were both important during the Early and Mature Harappan periods based on the large number of sites that have been surveyed.

The Ghaggar-Hakra River has been identified as the ancient Saraswati and the Chautang as the Drishadvati, which were often referred to in the Rg Vedic period. The earliest enquiry into this problem was made by Surgeon-Major C.F. Oldham. He extensively reviewed information on the course of ancient rivers, drawing not only on the geographic literature but also reconstructing a chronology of river flow on the basis of ancient literature, including the Vedas, Puranas, Mahakavyas, and Medieval chronicles. Oldham's most important insight was the connection between the Sotra or Hakra rivers and the dried bed of the Ghaggra. "The waters of all those streams combined could never, under any imaginable conditions, have maintained a permanent river of such magnitude as Hakra, for a distance of a more than five hundred miles beyond the furthest point to which they reach, at the times of their greatest floods" (Oldham 1874: 2).

The Chautang fed the Ghaggar River in the past, probably until around 2000 BC. Like the Ghaggar, the Chautang rises in the Siwaliks, flowing parallel to the now-dry river for some distance along a more southerly course. It turns west, passing Hissar and the archaeological sites of Siswal, Sothi, Nohar and Rakhigarhi. It the joins the Ghaggar at Suratgarh, near the sites of Kalibangan and Rang Mahal, which seem to have exerted some influence over this strategic junction.

Several archaeologists and geographers have strongly argued in favor of the identification of the Chautang river as the ancient Drishadvati mentioned in the Rgveda. The Ghaggar and Chautang, originating in the Sirmur area, used to flow through Jind, Hansi, Hissar and then after joining the Ghaggar at Hanumangarh and Cholistan desert, Pakistan, flowed south. Their courses are independent of the Indus River system. One or all of a number of factors led to the eventual drying of the rivers. These include uplift in the Siwaliks, tectonic activity in the Himalayas, increasing aridity in Rajathan, and increasing levels of deposited sediment in their channels. The relict beds are now more or less low plains. At present the Chautang is completely dry and the Ghaggar flows only seasonally in north Haryana. R.D. Oldham (1886: 339) has discussed the connection between the eastern Nara and the Indus in great detail and has pointed out that the Yamuna also contributed to the flow of the Ghaggar. He also argues that there was a bifurcation in the course of the Yamuna or Saraswati in the Vedic period, producing two minor drainage channgels – the Sarsuti and the Chitang (Chautang). (Oldham 1886: 343).

Wilhelmy (1969) was the first scholar who proposed that water flow shifted from the Chautang to the Yamuna. D.N. Wadia has argued that the Yamuna flowed through Punjab in the Vedic era under the name of the Saraswati. "In the course of time it took a more easterly course and merged into Ganges at Prayag. It then received the name Jamuna" (Wadia 1966). H.T. Lambrick (1964) states that the Yamuna was at one time a contributor, by way of the ancient bed of the mile-wide Chitang, but eventually slipped off the ridge to the East. However, the Indus Project has determined that the Chautang and Yamuna always flowed parallel and there is no possibility that they ever merged.

On the basis of aerial photographs and LANDSAT imagery, Bimal Ghose *et al.* (1979: 446-51) that there was a wide Saraswati valley running from Suratgarh through Anupgarh to Fort Abbas and Ahamadpur. Further from Anupgarh, another wide belt, ran southward in discontinuous patches up to Sakhi, then through a dark strip of vegetation through Khangarh, Islamgarh, Dharmi Khu, Ghantel, Shahgarh, Bubuwali and Rajar. This was the course

of the Saraswati from the Himalayas to the Rann of Kutch after the rivers entered relation to the Luni. Afterward the river gradually shifted westward and occupied the courses of the Wahinda and the Raini. The river then shifted westward to meet Sutlej near Ahemadpur East. The probable cause of these shifts is advancing sand and aridity. The authors also assert that tectornic activity may have contibuted.

Yash Pal *et al*. (1984: 496) used remote sensing data to identify a peculiar feature of the old beds of the Ghaggar, It tends to flow along straight lines that join together at sharp angles. This reflects structural control as the old Ghaggar seems to have flowed into an unstable channel controlled by the lineaments, probably enechelon faults. A little tectonic movement was sufficient to disturb its previous course and forced it into the present channel. Similar evidence has been noticed in the case of the Sutlej, as the river has followed a multitude of small channels before it found its present course. The authors proposed that the Sutlej was the main tributary of the Ghaggar in the past. Tectonic uplift probably contributed to the capture of the Sutlej by the Beas. Headward erosion and an extensive fault into which the river was diverted, probably facilitated the shift of the Sutlej into the Indus system. The authors point to the sharp westward right angle bend in the course of Sutlej west of Ropar as evidence of the river's capture. Like several of the previously discussed authors, Yash Pal *et al*. (1984) believe that the Yamuna may have contributed to the Ghaggar River. A map based on satellite imagery shows that the Yamuna changed its course at least three times before it occupied its present course.

By incorporating archaeological evidence, the authors have reconstructed the chronology of the geo-cultural events in the Ghaggar Basin. The Ghaggar was a dynamic river during the pre-Harappan and the Harappan times (3200 BCE - 2600 BCE and 2600 BCE - 2000 BCE respectively). The Chautang persisted into Late Harappan times (Yash Pal *et al*. 1984: 496). In 2007, the present authors conducted an archaeological survey of the Hanumangarh and Ganganagar Districts of Rajasthan and the Bhiwani and Rohtak Districts of Haryana, recording the locations of sites using GPS. Surprisingly, all the sites near Anupgarh area are actually located in the Ghaggar River course. This suggests that the Ghaggar (Saraswati) River had dried up long before the emergence of the pre-Harappan culture in this area. The true picture will emerge only when all of the sites in the Ghaggar Basin are visited and recorded using the GPS. Baladev Sahai suggests that tectonic movements have played a primary role in bringing about changes in river systems in northwestern Indian subcontinent.

Climatic factors must have exacerbated the problems caused by changes in the Ghaggar and Chautang rivers, but their effects are unlikely to have played a major role (Sahai 1999: 128). Thussu believes that changes in the direction of rivers could be result of combination of east-west and north-south forces related to the northward drift of the Indian peninsula. According to him, Somb and Boli – the tributaries of the present day Yamuna, were the main streams contributing to the Sarasvati. The Yamuna flowed through the Rakshi Nala/Chautang River (Thussu 1999: 205-217). Malik and others have highlighted the evolution of the delta complex of the Sarasvati and other extinct rivers in northwest India and the role of tectonic movements and aridity. In their recent investigations in the Rann of Kachtchh, they proposed that the formation of the delta complex system was a result of contribution of three rivers - Proto Shatadtru (Hakra), Saraswati and Drishadvati Rivers. They also recorded evidence of a fragmentary delta near the western flank of the Nagar Parker Hill joining the relict channel of the Sukri, a branch of the Luni River. They identified this channel as the ancient Drishadvati. A sequence of neo-tectonics around 3500 to 3000 years ago caused a significant decrease in the flow of water in the Sarasvati and the Drishadvati, while the Shatadru was diverted towards Indus (Malik

et al. 1999: 163-174).

S.P. Gupta has reviewed the available geological data and substantiated it with historical and archaeological literature (Gupta 2001: 30-5) and has strongly argued that the Sarasvati was a glacier fed river. R.S. Bisht (2002) states "the observations made and the theories propounded or conclusions drawn should remain subject to archaeological corroboration, because the palaeo-channels recorded in the imagery could belong to any point of time in the lifetime of the river system." Valdia (2002) supported the idea that continental drift caused tectonic upheavals and in turn hydrological changes in the northwest India. He states "the Saraswati River flowed through a wide channel, now known as the Ghaggar in the southwestern Haryana and adjoining northern Rajasthan. Its major tributary the Drishadvati, now known as the Chautang, drained the eastern uplands of Haryana. It was the floodplain of the Saraswati in which the Harappan settlements were located. More interdisciplinary work is required to understand the courses of the Ghaggar and the Chautang and their relation with the Harappan culture. It is also necessary to determine the chronological phases in which both rivers were active before their relationship with Early and Mature Harappan culture can really be understood. More interdisciplinary work involving archaeologists, geologists, and paleo-climatologists will be necessary to address this problem.

Notes

1) Most of the information on the ecology of the Ghaggar and Chautang basins has been supplied by Mr. Tejas Garge who is working in this area for his Ph.D. research. The authors are grateful to him for this.

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CHAPTER 3

RESEARCH METHODOLOGY

BY VASANT SHINDE

The authors carried out three seasons of excavation at the site of Farmana. The research strategy employed during these excavations was specifically designed to meet the goals laid out in the introductory chapter of this volume. Once an area was selected for excavation, one or more adjacent 5 m × 5 m trenches were laid out. Several of the laid out trenches were then selected for excavation. The excavation of adjacent trenches was contingent on the kinds of data produced by the trenches selected for excavation. Sometimes it was not necessary to excavate all of the trenches that had been laid out, and at other times it was necessary to excavate only half of a trench. Such instances will be noted in the following discussion.

All the trenches in the main habitation area were oriented in cardinal directions (Figures 3.1 and 3.2). They were laid out from the datum point located in the south-eastern corner of Locality 1. These trenches were assigned letters according to their North-South distance from the datum, and numbers based on their East-West location. Initially, a baulk of 25 cm was left surrounding all the trenches, but these were removed once the excavation was complete. Each trench was divided into four quadrants, and when natural contexts were not apparent, each quadrant was excavated separately. Structures and features were traced on plan and then divided into two or four sections, each of which was excavated separately to ensure stratigraphic control. Depths for all the trenches were taken from the top of the Datum Peg. Sub-datums were extended from this point to the different parts of the settlement so that the depths of all the trenches could be related to the site's Datum Peg. Excavated material were divided into lots that, when possible, reflect distinct archaeological contexts. When a particularly important artefact was discovered, such as beads, bangles, seals or sealings, its three-dimensional location was recorded. Soil was either sorted with knives in the trenches or sieved. Soil samples from each Lot were collected for botanical analysis, and some of these were floated on site. Pottery and bones were organized in a gridded pottery yard. They were washed, classified, measured, counted, and selected for further studies. Each and every object has been considered in light of in its proper archaeological context, enabling reconstruction of socio-economic aspects.

In the first season (2006-07), a few trenches were selected for excavation in order to examine the site's cultural and ceramic sequence and assess the site's potential for further large-scale work. Three index trenches were excavated at different locations within the site. The first index trench (Trench- 1) was placed on the highest point of the site, which is 20 meters north and 5 m west of the the site's datum point. The second trench (Trench- 2) was located 10 m further north, and the third index trench (Trench- 3) 20 m north and 10 m west from the second index trench. The trenches were labeled with simple Arabic numbers beginning with the trench located at the highest point. Excavation could not continue down into the lower levels of Trench nos. 1 and 2, as they contained brick architecture, whereas we managed to reach to

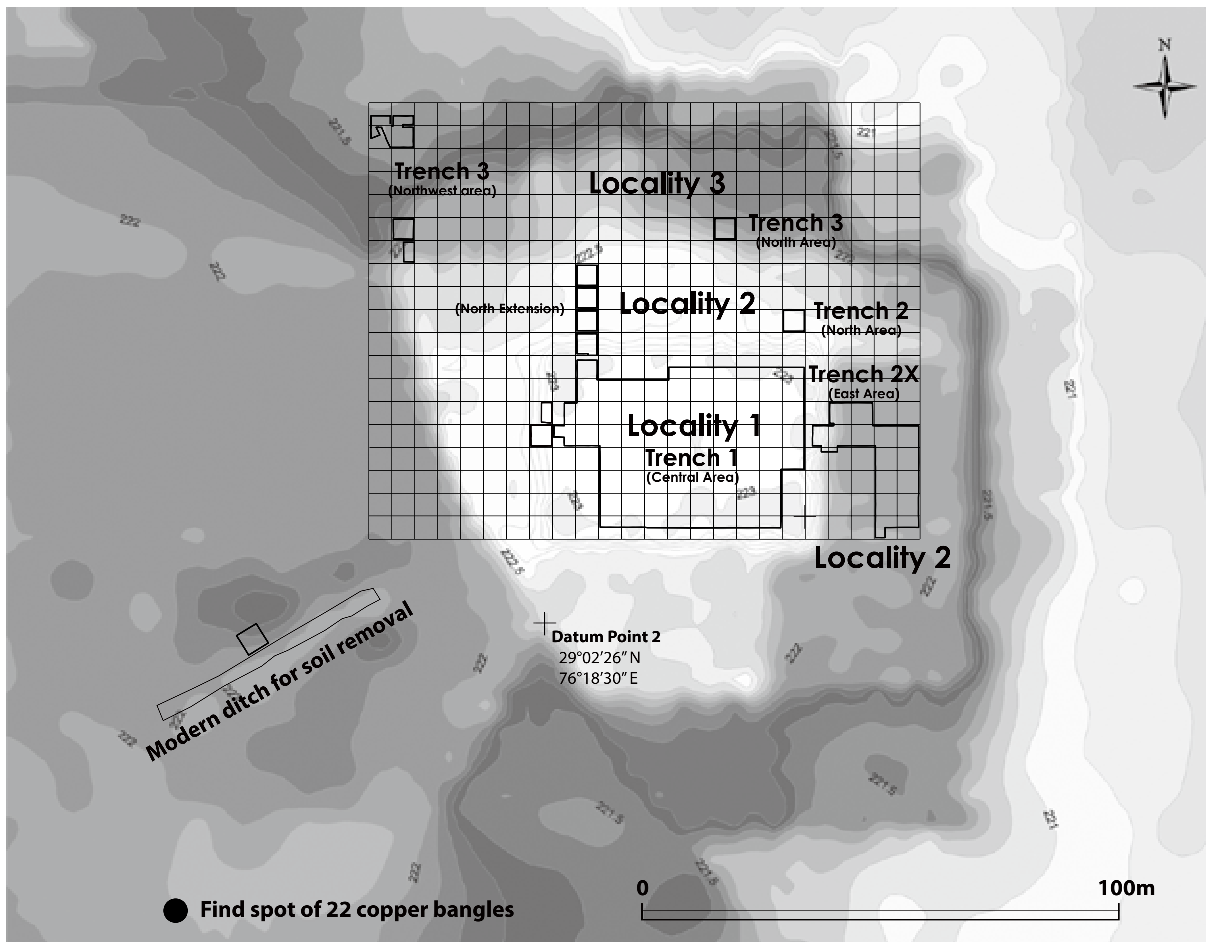


Figure 3.1 Location of the excavation areas based on 5 m grids

the natural soil in Trench no. 3. Taken together, the index trenches made it possible to record the entire stratigraphic and culture sequence of the site. Two distinct cultural periods were apparent: Period I - the Regional Hakra Culture and Period II - the Mature Harappan. Since the upper deposit had been removed in the process of converting this site into agricultural land, no remains of the Late Harappan, PGW or Early Historic periods were found in the excavations. The extant habitation deposit at the site was 2 m, which contained 8 distinguishable habitation layers. It appears that layers (7), (7a) and (8) belong to the Hakra phase (total thickness 50 cm). Layer (6) appears to be a transition period from the Hakra to the Mature, whereas the first five layers belong to the Mature Harappan period.

Part of a very large structural complex was first identified in Trench 1. The authors thereafter decided to conduct horizontal excavations around the trench, exposing more of the complex to trace the layout of the structure. Five more 5 m × 5 m trenches, numbered 1A, 1B, 1C, 1D and 1E, were selected for excavation. These were mostly to the south and east of Trench- 1 (Shinde *et al.* 2008a)

1 2007-08 SEASON

To investigate Mature Harappan town planning at Farmana, the team selected the highest portion of the site for horizontal excavation. It was also decided to open another trench immediately to the north of Trench 3. The purpose of this trench was to excavate material from the Early Harappan level and finish exposing the dwelling pit which was first identified in 2006-07. During this season, the team also assigned

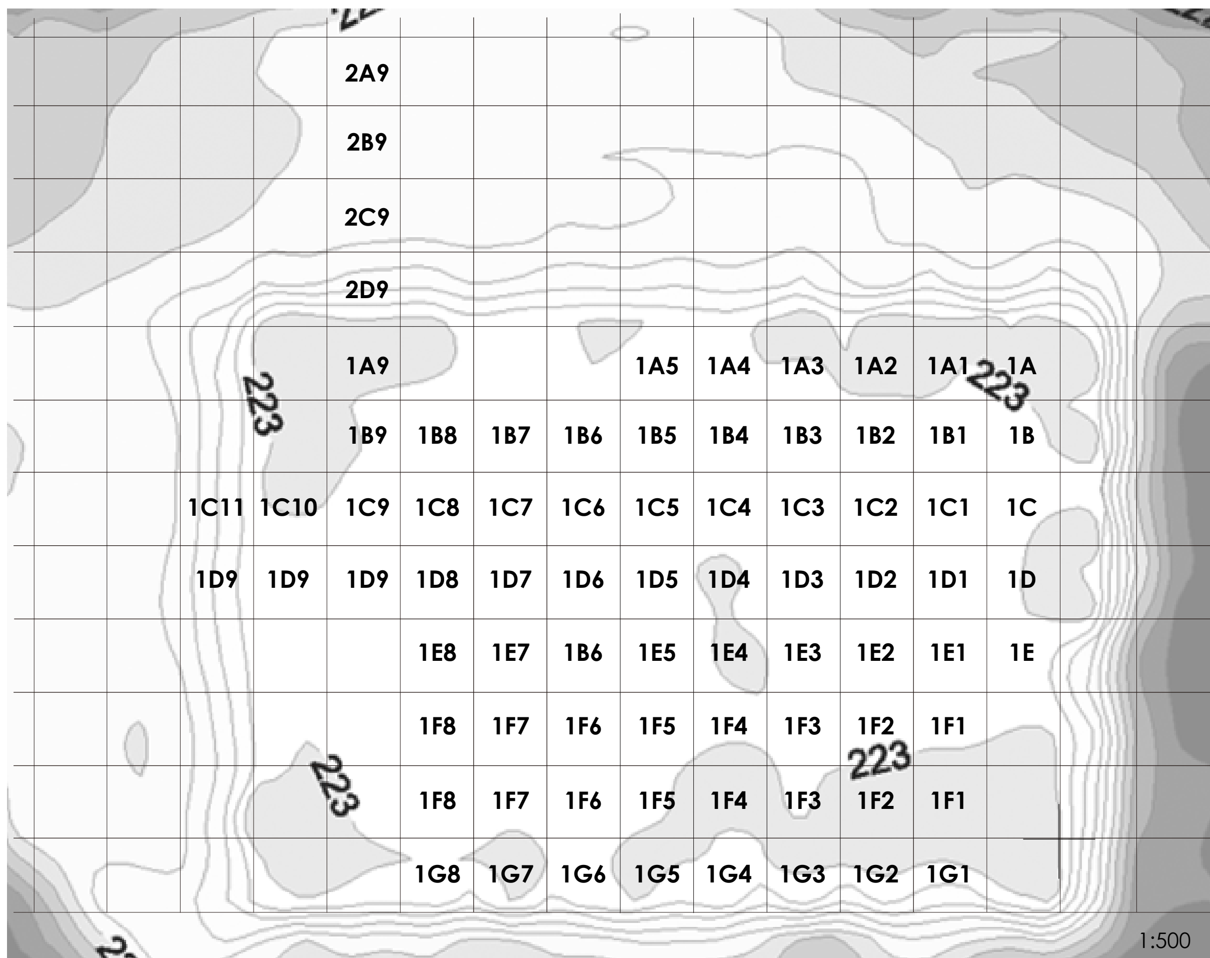


Figure 3.2 Trench numbers of the Central Area

locality numbers to distinct topographical features that comprised the site. The locality system accounted for the terraced nature of Farmana's surviving archaeological deposits, facilitating systematic excavations in topographically distinct areas of the site. The highest portion of the mound was assigned Locality 1, which is confined to an area of the centre that extends to just over one and a half acres. The middle portion of the site that surrounds Locality 1, roughly 30 to 50 cm below the level of Locality 1, is treated as Locality 2. This area belongs to a different owner. The lowest levels of the site, 30 to 40 cm below Locality 2, spreading in all direction and forming the maximum portion of the habitation, were treated as Locality 3 (Figure 3.1).

One of the main aims of the 2007-08 excvation was to uncover structures from the Mature Harappan phase in order to investigate town planning and the socio-economic organization of Farmana. Along these lines, a major portion of Locality 1 was selected and gridded for excavation. In all, 43 trenches measuring 5 m by 5 m were opened in this locality. The following figure provides a plan of the trenches excavated during the 2007-08 season.

Trenches to the south of those excavated in the 2006-07 season include:

1C1 (SE quadrant)
1D1 (western half)
1E1 (NW, SW and SE quadrants)
1E, 1F1, 1G1

To the west of these trenches are:

1A2 (SE and SW quadrants), 1A3, 1A4 and
1A5 (SE and SW quadrants)

1B2, 1B3, 1B4, 1B5 and 1B6
1C2, 1C3, 1C4, 1C5 and 1C6
1D2, 1D3, 1D4, 1D5 and 1D6
1E2, 1E3, 1E4, 1E5 and 1E6
1F2, 1F3, 1F4, 1F5 and 1F6
1G2, 1G3, 1G4, 1G5 and 1G6
1H5 and 1H6 (northern half)

Besides the above-mentioned trenches, two additional areas were selected for the excavation of 5 m by 5 m test trenches. Trench 3X, 115 m to the west and 27 m to the south of the datum line and 3A3, 66 m to the north and 17 m to the west of the Datum Point were selected for excavation. Trench 3X was excavated in order to expose some of the Early Harappan pits visible along the section of the channel made by a local farmer for lifting the soil. Trench 3A3 was excavated to expose the entirety of the pit-dwelling identified last year. Due to the presence of floors, walls and fire places from the Mature Harappan phase, digging could not be continued into the Early Harappan levels this season.

One of the most significant discoveries of this season was a cemetery dating to the Mature Harappan period at an approximate distance of 900 m to the northwest of the main habitation site of Farmana. Mr. Vikas Pawar and Mr. Vivek Dangi, Ph.D. students of the Department of History, M.D. University, Rohtak, found the cemetery by accident. A farmer from Semen village was slicing the upper layer of the soil with the help of a tractor and found some fragmentary human bones and number of complete and broken pots. These finds were handed over to the students. After surveying the area reported by the farmer, the students identified human skeletons and complete pots in a section of the ditch made in the middle of the field by the owner who was lifting soil. Surface finds, including human bones a broken pots, were spread over an area of 3 ha. Though the cemetery technically falls within the jurisdiction of Seman village, it was labeled the Farmana Harappan Cemetery due to its nearby association with the site of Farmana (Shinde *et al.* 2008b).

2 2008-09 SEASON

The large, horizontal excavation of Locality 1 that was undertaken during the 2007-08 season revealed a number of significant architectural features. These include a main street, two small streets, three large multi-roomed complexes, rectangular fire and storage pits. The complexes were not excavated in their entirety, so it remained unclear just how large they were. There was little hope of recovering the remaining part of the Structure Complex 2 (need figure) as it had been cut towards the north, east and south by the farmers. Luckily, the deposit covering the western part of Structure Complex 3 and the southern part of Structure Complex 4 appeared to be intact. Since this locality was to be ploughed, the team decided to open the unexcavated areas to the south and west of the area excavated in 2007-08 (Fig. 3.2). In 2008-09, the following trenches were opened in order to expand the exposure of Structure Complex 3 and 4:

1A7, 1B7, 1C7, 1D7, 1E7, 1F7, 1G7 and 1H7 (northern half only), 1B8, 1C8, 1D8, 1E8, 1F8, 1G8, and 1H8 (northern half only), 1A9, 1B9, 1C9, 1D9, 1E9, 1F9, 1G9 and 1H9 (northern half only) and the eastern half of 1B10, 1C10, 1D10, 1E10, 1F10, 1G10, and northeastern quadrant of 1H10.

Structure Complex 3 was completely excavated. Unfortunately, agricultural disturbance rendered some of the rooms in the southern portion of Structure Complex 4 difficult to reconstruct. Still, some of the rooms that had only been partially exposed in 2007-08 could be completely excavated.

To investigate the cultural development of the site, the team decided to excavate more material

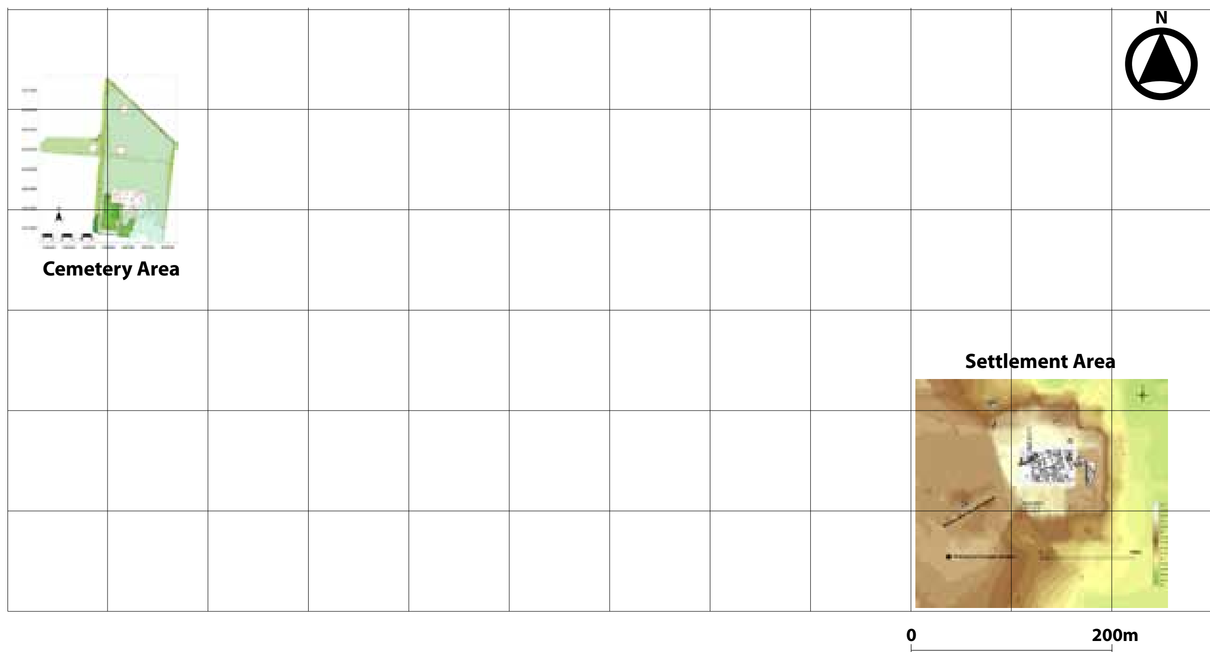


Figure 3.3 Locations of the Settlement Area and the Cemetery Area

belonging to the Early Harappan period. Thus, areas that had produced Early Harappan materials in previous seasons were selected for extended horizontal excavation. The following areas were selected:

A large portion of Locality 2 on the eastern side of Locality 1 was selected as the authors believed it would produce evidence of structural development and other cultural activities that date to the early part of the mature Harappan. A large part of this area was gridded and trenches 2XC2, 2XC3, 2XD1, 2XD2, 2XD3, 2XD4, 2XD5, 2XE4, 2XE5, 2XF4, 2XF5, 2XG4, 2XG5, 2XH4 (NE, NW and SW quadrants) 2XH5 (NE, NW). The southeastern portion of Locality 1, consisting of trenches 1H1, 1H2, 1H3, 1H4 were excavated in order to identify the extension of the structural complex (see Figure 5.16).

To the north of 1A9, the team laid trenches in Locality 2 along a straight line in the north-south direction. The first trench to the northern extreme of Locality 2 was A9. To its south were 2B9, 2C9, 2D9. Excavation was only carried out in 2B9, 2C9, 2D9. This exposure was aimed at characterizing the nature of the structures from the early part of the mature Harappan and extension of Structural Complex 3 excavated last year.

To determine whether or not there was a fortification wall at the site of Farmana a resistivity survey was carried out along a modern road that divides the site in half. An area of 60 m (N-S) by 10 m (E-W) immediately east of the road was tested. The results indicated the presence several underground hard surfaces towards the northern part of the selected area. The team decided to investigate the nature of these surfaces by conducting test excavations. A number of trenches were laid out in the N-S direction. The first trench began on the junction of Locality 2 and 3. This trench was given the number 2A17. To its north are trenches 3Z17 and 3X17, both in Locality 3. The eastern half of 2A17 and 3Z17 were excavated, and trench 3Y17 was fully excavated. Several other trenches were placed 15m to the north of 3Y17. All four trenches were excavated. They include 3U17, 3T17 (SE, SW Qdts), 3U18 (NE, SE and NW), and 3T18 (SE, SW Qdts). 3T17 is at the northern end of the line, 3U17 is to the south of 3U18, and 3T18 is to the west of 3T17(see Figure 5.53).

To determine the extent of the Early Harappan occupation at Farmana and investigate the formation of the Mature Harappan team excavated a number of index trenches in different parts of the site. Four such

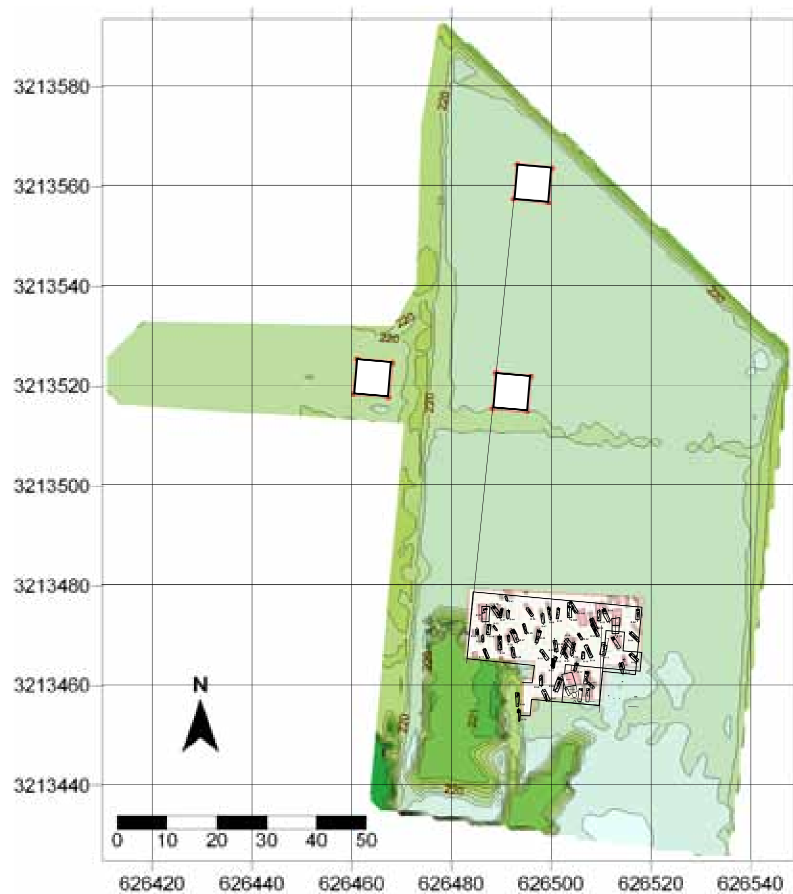


Figure 3.4 Contour map of the Cemetery Area

trenches were excavated until the team reached virgin soil. The first was the eastern half of 1C11, located to the north of 1D11. The south-eastern quadrant of this trench was dug until virgin soil was reached. This index trench is located on the junction of Locality 1 and 2. The second Index trench, 2D9, is located to the north of the junction of Locality 1 and 2. The third is was the SW quadrant of 1D5 was dug to the Mature Harappan level. The fourth index trench is located on the eastern junction of Locality 1 and 2. Parts of the northern half of trenches 2XD1 and 2XD2 were excavated to the natural level. These index trenches have provided additional information on the history of the site including cultural and ceramic sequences.

3 TRENCH PLAN IN FARMANA CEMETERY

To the east, west, north and south of the burials (1-7) excavated in the 2007-08 season, a number of trenches were laid out in order to expose a large part of Harappan Cemetery at Farmana (Figure 3.5). Unlike excavations at the main site, a 7 × 7 m grid was used to divide the semetery. The trenches were numbered using a alphabetical/numeric system in place in the other areas of the site, excepting that alphabetical labels proceed from east to west and numerals from north to south. Additionally, each trench number was given a "C" prefix to differentiate its material from that which was excavated in the habitation area.

A new datum point had to be established to excavate the cemetery. This datum is located roughly 37.5 m to the east and 3.5m to the south of the northern end of the ditch dug by the owner of the field for lifting the soil. Trenches from all sides of the datum point were given numbers, but the majority of trenches lie between the east-west and north-south line of the datum. One trench line each extends on

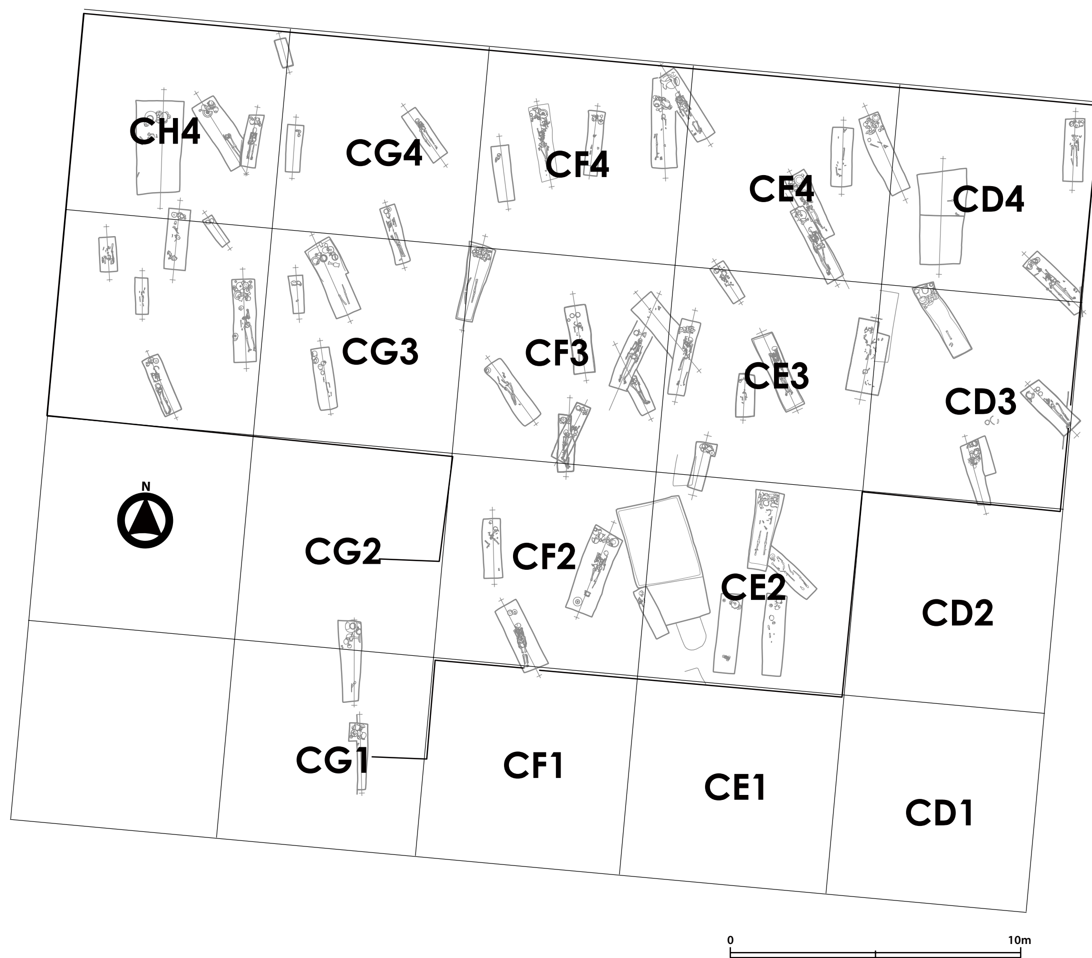


Figure 3.5 Layout of trenches in the Cemetery Area

south and east of the datum line. Trench CA1 lies to the south-east corner of the datum whereas CB1, CC1, CD1, CE1, CF1, CG1 and CH1 lie to the south of the east-west datum line. Trenches CA2, CA3 and CA4 lie to the east of the south north datum line. Trenches CB2, CC2, CE2, CF2, CG2 and CH2 are located to the west of the datum line. The next two lines of trenches, including CB3, CC3, CD3, CE3, CF3, CG3, CH3, and CB4, CC4, CD4, and CE4, CF4, CG4, CH4 are north of the trenches located to the west of the datum point. Of the trenches mentioned above CF2, CD3, CE3, CF3, CG3, CH3, CD4, CE4, CF4, CG4, CH4 were selected for excavation. A small portion of trenches CG1 and CG2 has also been excavated as burial no 69 lies in between these trenches (Figure 3.5).

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CHAPTER 4

STRATIGRAPHY AND CULTURAL SEQUENCE IN TRENCHES 1C11, 2D9, 1D5 AND 2XD1-2XD1

BY VASANT SHINDE

Four Index trenches were excavated – one in the Western, Central, Northern and Eastern parts of the site. Due to the presence of an agriculture field, it was impossible to establish an index trench in the Southern area of the site. Vertical excavations in these trenches allowed the team to examine the site's stratigraphy, which is described below:

1 STRATIGRAPHY OF INDEX TRENCH 1C11

The southeast quadrant of 1C11 was excavated to natural soil. As it is on the junction of Localities 1 and 2, the entire stratigraphy of the surviving mound is visible in its sections. Thus, this trench is critical to understanding the succession of cultural phases at Farmana. In all, 14 layers were identified in the excavated area. The total habitation deposit of the mound measures 3.25 m within this trench. (Figures 4.1 and 4.2).

Layer 1

This layer is heavily disturbed due to human activity, as it lies in the ploughing zone. It is loose in nature, slightly dark gray in colour, and has survived to an average thickness of 10 cm. It contains mixed material that is characteristic of disturbed layers.



Figure 4.1 Location of Index Trenches

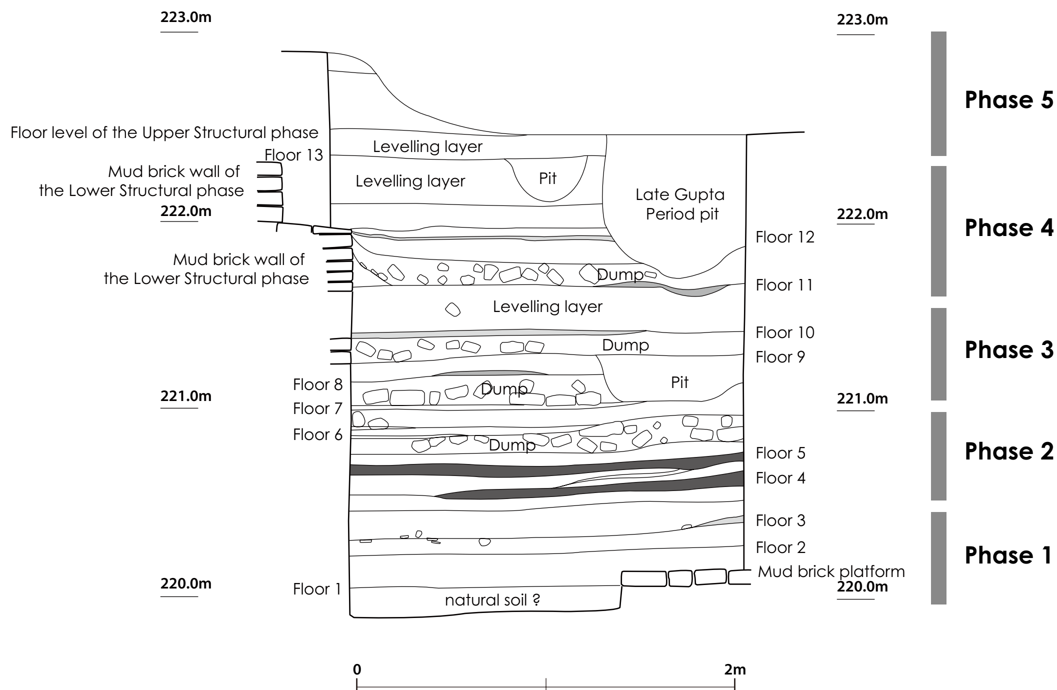


Figure 4.2 Cross-section of Trench 1C11 facing south (1:40)

Layer 2

This layer begins at a depth of 43 cm and ends at 69 cm from the datum point. It is undisturbed, slightly compact, and almost homogeneous, containing a few potsherds and bones at places. This layer, with an average thickness of 22 cm, appears to have been made of collapsed wall material and is light gray in colour.

Layer 3

This layer is similar to Layer 2, but is brownish in colour and uneven at the base. It is more homogeneous than layer 2 but loose in composition. Its average thickness is 17 cms. It begins at 69 cm and ends at 90 cm from the datum point.

These upper 3 layers were identified in the southeast corner of the southeast quadrant in the trench.

Layer 4

This ashy layer is loose in composition, and uneven at the top and base. It starts at the depth of 90 cm and ends at 1.06 m. In the centre of the layer is a small pit with a diameter of 40 cm. It is 22 cm deep in the centre. To its west at a distance of 10 cm is another pit, which is much larger. The diameter of the pit visible in this section is 80 cm and it is 54 cm deep. It has cut parts of Layers 5, 6 and 7 towards its western end.

Layer 5

This layer is even on top and slightly uneven at the bottom. It is ashy in colour, slightly loose in composition, but homogeneous in nature. It contains potsherds at places. The average thickness of this layer is 16 cm. It begins at 1.06 m and ends at 1.22 m from the datum point.

Layer 6

This layer is dark gray in colour, heterogeneous, and more or less horizontal both at both the top and bottom. In the upper 10 cm it contains slightly hard material, probably from a fallen wall, whereas the lower 7 cm is loose, composed of debris material. The layer is heterogeneous in its lower part as it contains small pebbles, potsherds and bones at places. Its



Figure 4.3 Index Trench 1C11 located on the junction of Localities 1 and 2 showing cultural debris, stratigraphy and features



Figure 4.4 Two mud-brick walls in Index Trench 1C11, the lower belonging to Period IIA and the upper Period IIB

average thickness is 17 cm. It begins at a 1.22 m and ends at 1.38 m.

Layer 7

This layer is thick towards its eastern end (22 cm) and thin towards western end (12 cm). It is light brown in colour and compact. It is made of brickbats and contains only a few potsherds on either end. It begins at a depth of 1.38 m and ends 1.54 m from the datum point.

Layer 8

This layer is horizontal, similar to Layer 7 but lighter in colour. It contains pebbles and potsherds. Its western side has been disturbed by a rodent hole. Its average thickness is 20 cm. It begins at 1.54 m and ends at 1.74 m.

Layer 9

This layer is also horizontal and made of brick wall material. It is brown in colour, hard and compact, and homogeneous in nature. Toward the centre of its upper part there is a burnt patch of clay. Its average thickness is 18 cm. It begins at 1.74 m and ends at 1.93 m.

Layer 10

This layer is similar to Layer 9. It has been cut by a pit towards its western end. In the lower part of the layer is a mud-brick feature, probably part of a wall. The pit towards its western end is 68 cm in length and the same width as the layer. It is horizontal both on top and at its base. Its average thickness is 25 cm. It begins at a depth of 1.93 m and ends at 2.17 m.

Layer 11

This layer is similar to Layer 10. It is also made of mud-brickbats but contains cultural material. This material includes TC cakes, charcoal bits and sporadic potsherds. It is very hard and compact and is darker in colour than Layer 10. It is broader (35 cm) in the western end. Throughout most of its length 28 cm in width.

Layer 12

This layer is gray, heterogeneous, and composed ash and mud-brick wall material. It is loose in composition and contains horizontal lenses of ash, potsherds, pieces of TC cakes, and charcoal bits. It is uneven towards its western end. Its average thickness is 26 cm, and it begins at a depth of 2.47 m and ends at a depth of 2.73 m.

Layer 13

This layer is the first occupational layer at the site, as it overlies the natural deposit of fine sand. It is light brown in colour, horizontal in orientation, loose, and contains small pebbles, potsherds and burnt clods of clay. It begins at 2.73 m and ends at 2.83 m. Its average thickness is 20c m.

Layer 14

This layer forms the natural surface underlying the site. It is composed of a loose uniform/homogeneous deposit of fine sand. It is yellowish/brownish in colour and forms part of a silt deposit.

On the top of the virgin level is a platform made of bricks, some of which are complete and some of which are broken. The platform appears to be either rectangular or square on plan and only its southeast corner is visible in the index trench. The area over which it is exposed measures 2 m from north to south and 1.50 m from east to west. The bricks and brickbats used in its construction are set in yellow mud mortar. Its complete bricks measure 40 cm in length, 20 cm in width, and 10 cm in thickness, conforming to the 4:2:1 ratio typical of Mature Harappan settlements. Complete bricks were used in the corner of the feature. The platform has survived to a thickness of 10 cm.

Based on the evidence gathered during the excavation of the first Index Trench (No. 3) and observations of cut sections on the western side of the

site, it appears that the early settlers at Farmana lived in pit dwellings. However, the presence of a platform at the base of this index trench indicates that mud-brick structures were in use right from the beginning of occupation at Farmana. Excavations carried out in this index trench, along with those at sites like Banawali in the Ghaggar Basin, indicate that the Early Harappan brick ration of 1:2:3 is almost absent in this region of the Harappan Civilization. Traces of mud-bricks found at Girawad at its Early Harappan levels possessed the 1:2:4 ratio, further evidence in support of our hypothesis that Early Harappan mud-bricks in the Ghaggar Basin had a ratio of 1:2:4.

Two cultural periods were clearly identified in this index trench. On the basis of ceramics and stratigraphy, the upper 10 layers belong to the Mature Harappan Period, whereas the lower 3 layers belong to Early Harappan levels.

Mud brick walls in the eastern half of the trenches

Two mud-brick walls belonging to two different structural phases of the Mature Harappan Period were noticed in this part of trench. Both walls are made of bricks and are oriented 250 in the northwest to southeast direction (Figure 4.3). Both belong to the Mature Harappan phase and appear to be the western walls of the structure lying in the unexcavated eastern section.

The wall that belongs to the upper phase was excavated to a length of 3.95 m. It is 60 cm in width and survived to a thickness of 22 cm. Two courses of its mud-bricks are visible. The average size of the bricks used for its construction is 30 × 15 × 7.5 cm with a ratio of 4:2:1.

The wall of the earlier construction phase is located at a depth of 23 cm from the wall of the later construction phase. The orientation of this wall is identical to the wall above it. This wall was excavated to a length of 3.26 m but most probably continues further towards the northwest to a length of 4.80 m. The eastern edge of this wall underlies the western part of the wall from the later phase. The width of the wall is 40 cm. The wall is survived by 2 basal courses of bricks (20 cm).

Below this wall are a number of traces of mud-brick walls belonging to earlier phases. These traces indicate that there were at least four additional structural phases of mud-brick wall construction, each wall placed above the one that preceded it, during the Mature Harappan Period. In all, there were at least 6 structural phases during the Mature Harappan Period.

2 INDEX TRENCH IN 2D9

This trench was selected for excavation for two reasons.

1) To identify the extension of the structural complexes excavated in Locality 1 to the south.
2) To reconstruct cultural sequence and determine the extent and nature of early Harappan occupation in the south.

The team decided to excavate an area that lies on the junction of Locality 1 and 2 as an index trench in order to expose the entire cultural sequence of the site. This trench is located in the southeast part of the area that extends towards the north. It encompasses part of trench 1A9 (1.10 m) along the eastern line and part of 2A9 trench (2.75 m). It was necessary to select an area that partly covers and overlaps these two trenches. The stratigraphy in this index trench matches that which was uncovered 1C11, the only difference being that the total deposit of 1C11 is 3.25 m, whereas only 3 m of cultural material was found in this trench (Figures 4.5 and 4.6). The other similarity is that the walls indicating the presence of two different structural phases of the Mature Harappan Period are also found in this trench at the same level. The early wall is much better preserved in than in 1C11, with a total thickness of 29 cm and three distinct courses of bricks evident. Both walls are probably the northern walls

of structures running in the northeast to southwest direction. The wall of the later phase, sitting on top of the earlier wall and parallel to it, with a thickness of 27 cm and three brick courses apparent. In both cases the bricks are set in brown mud mortar and have been exposed to a length of 2.25 m.

Beneath this wall were found a number of structural levels, three of which are visible in the eastern section facing west. The walls however are not apparent in the southern section facing north and western section facing east. This indicates that only the extreme western periphery of the earlier structures apparent in Trench 2D9 were exposed.

Layer 1

This layer is considerably thick (35 cm) and light gray in colour. Its upper part is disturbed because of ploughing. It is loose whereas the lower portion is compact and undisturbed. It ends at 70 cm from the datum point.

Layer 2

This layer is grayish in colour and uneven on top. The upper part of is brownish and made of collapsed wall material, which is hard and uniform. The lower part is heterogeneous and contains potsherds, TC cakes and a few bones. The lower portion of the layer is slightly loose. Its average thickness is 32 cm. It ends 1.03 m from the datum point.

Layer 3

This layer is uneven, thick (30 cm) towards the southern end, and thin (14 cm) towards the northern end. It is compact but disturbed at places due to insect and root holes. It is light grayish in colour and it begins at 1.03 m and ends at 1.26 m.

Layer 4

This layer is similar to Layer 3, except that it is loose and heterogeneous and contains ash lenses and charcoal bits. It is thick (28 cm) towards the northern end and thin (15 cm) towards the southern end. It begins at 1.27 m and ends at 1.43 m.

Layer 5

This layer is brownish/grayish in colour and composed of mixed material that includes wall and garbage material. It is more or less horizontal both at top and bottom, but towards the southern end is an 8 cm thick ash deposit found over an area of 65 cm. It is loose and contains lot of potsherds, TC cakes, and bones. Its average thickness is 18 cm. It begins at 1.43 m and ends at 1.60 m.

Layer 6

This layer is brownish in colour, hard, and compact. It is composed of wall material. It is uneven, thick (20 cm) towards southern end and almost merges with Layer 7 in the northern end. It contains broken potsherds at places and is brownish in colour. It begins at a depth of 1.68 m and ends at 1.87 m.

Layer 7

To the north of this layer is the remnant of a mud-brick wall that has survived to a thickness of 30 cm over an area of 85 cm. This part of the wall is very compact and homogeneous, without any cultural material. Against this wall is layer 7, which is dark yellowish in colour, loose in composition, and contains charcoal, potsherds and ash at its base. It is uneven towards its northern end. It rises over the wall and ends at the top. Towards the southern side it has become horizontal and its average thickness is 10 cm. This begins at 1.87 m and ends at 2 m.

Layer 8

This layer is perfectly horizontal and brownish in colour, very hard in composition and composed of brick wall material. Hardly any potsherds were found embedded in this layer. Its average thickness is 20 cm. It begins at 2 m and ends at 2.18 m from the datum point.

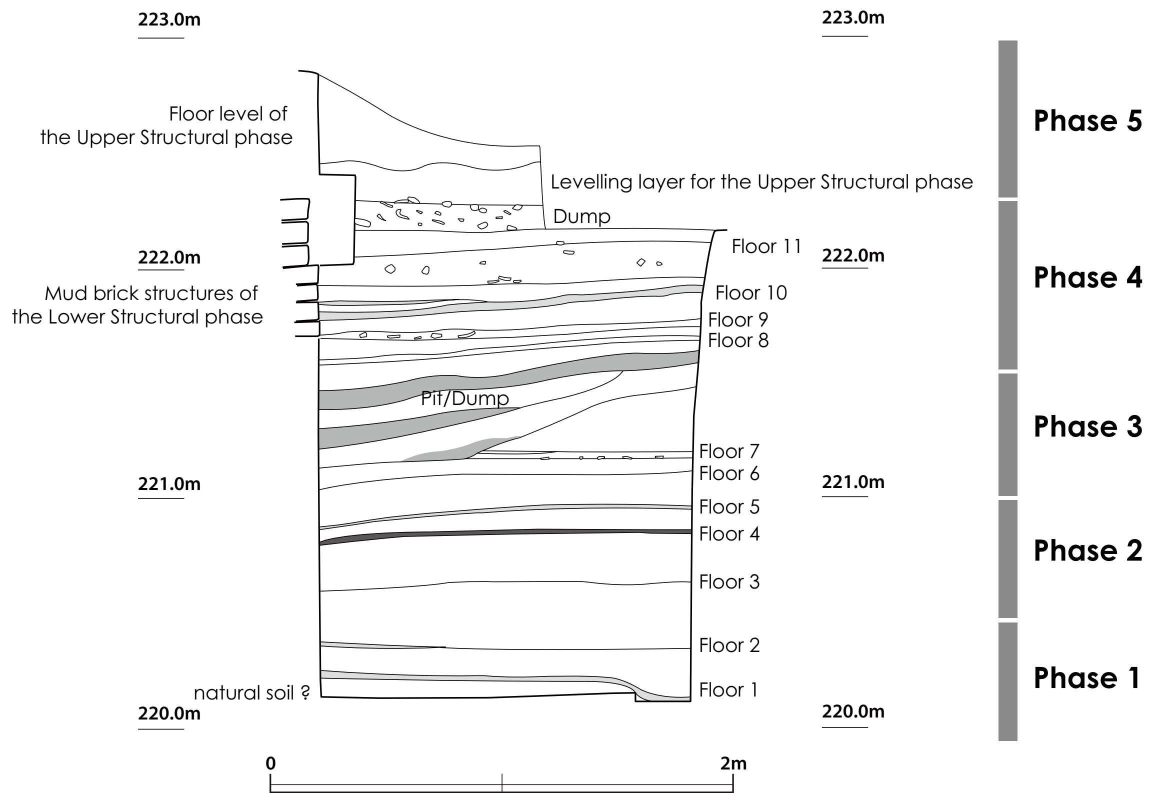


Figure 4.5 Cross-section of Trench 2D9 facing west (1:40)



Figure 4.6 Index Trench 2D9 located between Localities 1 and 2 on the northern side showing cultural debris and stratigraphy

Layer 9

This layer is also composed of structural material similar to 8 above, except it is darker in colour. It is also horizontal and has an average thickness of 20 cm. It begins at 2.17 m and ends at 2.30 m from the datum point.

Layer 10

This layer is composed of a typical habitation deposit including ash, mud, and cultural material like pottery, bones and a few terracotta cakes. It is uneven on top but horizontal at its base. It is gray in colour and loose in composition. Its average thickness is 17 cm. It begins at a depth of 2.30 m and ends at 2.52 m.

Layer 11

This layer, which begins at 2.52 m and ends at 2.62 m from the datum, is a thin layer that is almost horizontal and similar to Layer 10. It is light gray in colour, heterogeneous and loose in composition. Its average thickness is 10 cm.

Layer 12

This layer is the first occupational layer at the site, sitting on the top of a natural sand dune deposit. It is uneven at its base. Towards its southern end it is 14 cm and it broadens to 32 cm in its northern end. It is light yellowish in colour, loose in composition, and contains a few potsherds and pebbles at places. It begins at 2.62 m and ends at 2.77 m from the datum point.

Layer 13

This layer is a natural sand/silt deposit. It is composed very fine and homogenous materials lacking any cultural remains. The first settlers dug pit dwellings into this deposit.

3 INDEX TRENCH – 1D5 (SW QUADRANT)

This index trench was selected for excavation to understand the relationship between different structures and structural levels in the stratigraphy of the site. It is located in the centre of Locality 1 within Structural Complex 3 (Figures 4.7 and 4.8).

The stratigraphy of southern section facing north is comparatively intact and contains the following sequence of strata:

Layer 1

This layer is composed of typical gray habitation material, loose in composition with typical cultural remains including bones and pottery.

Layer 2

This layer has been partly destroyed by two pits that were dug at two different times. The later pit is cuts across nearly the entire face of the section. It gradually tapers in the centre. It has been excavated to a length of 1.90 m and is 60 cm deep in the middle. It contains typical garbage material.

The deposit of Layer 2 is brownish in colour, homogeneous, hard and compact, and slopes towards the eastern side. It has been destroyed by a small pit which is 1 m in length and is 40 cm deep in the middle. This pit contains loose, brownish soil, charcoal bits and potsherds. It is quite thick, with an average thickness of 45 cms. It is made of wall material.

Layer 3

This layer is similar to Layer 2 except that it is homogeneous and contains almost no cultural material. It is dark brown in colour with an average thickness of 30 cm.

Layer 4

This layer is similar to Layer 3 in all respects. It is made of wall material that belongs to a different

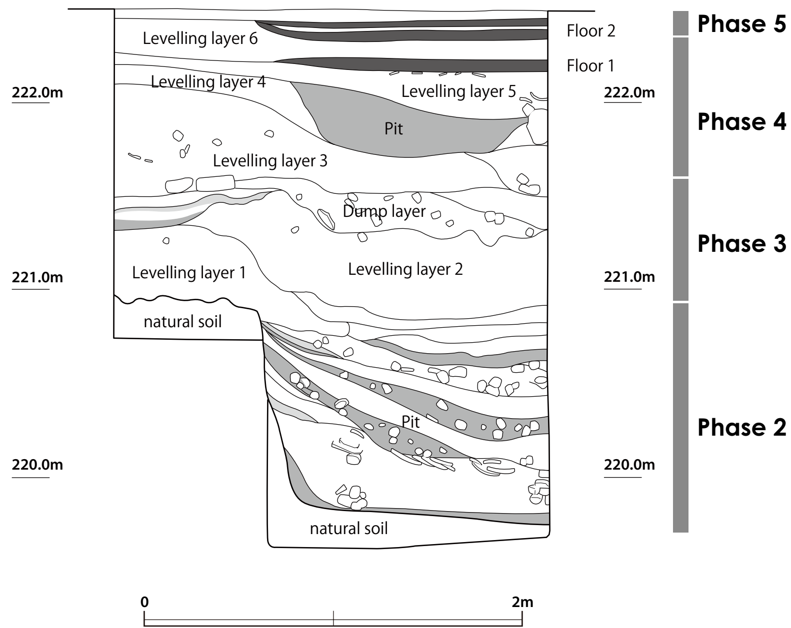


Figure 4.7 Cross-section of Trench 1D5 facing east (1:40)



Figure 4.8 Index Trench 1D5 located in the centre of Locality 1 showing cultural debris, stratigraphy and features

structural phase, separating it from Layer 3. Its average thickness is 30 cm.

Layer 5

This layer represents another structural level and is similar in all respects to Layer 4. Its average thickness is 20 cm.

Layer 6

This layer is made of mixed material consisting of decomposed organic matter and habitation soil. The upper part is light grayish in colour for a thickness of 4 cm. The lower part is light yellow in colour. It is loose and heterogeneous in nature, containing small burnt clay clods, charcoal bits and small fragments of potsherds.

Layer 7

This layer is a thin dark layer made of clay. It is soft and almost homogeneous, sealing the pit beneath it. Its has an average thickness of 6 cm.

Below this layer is a large pit that was cut into natural soil. Considering its huge size, vertical sides, and flat bottom, it appears to have been a dwelling pit with a depth of 80 cm. Subsequently, this so-called pit dwelling was abandoned and filled in with typical garbage material, composed of a huge number of big potsherds, bones and pebbles. This pit was not filled at a single time but gradually over a long period of time, as four layers are identifiable within it. The first 2 layers from its base contain large potsherds, bases, and pebbles. Together they are 50 cm thick. Above is a 17 cm thick deposit of silt mixed with habitation soil and ash. It contains fewer potsherds and bones. The topmost layer of 14 cm is a typical garbage deposit consisting of ash in the lower part and burnt yellowish soil in the upper part. At the base of the pit is natural sand /silt deposit. There appears to be a very thin Early Harappan deposit in this trench. In this trench, only Layer 6 contains cultural materials from the Early Harapan Period.

4 INDEX TRENCH 2XD1 (NE) AND 2XD2 (NW)

Intentionally, sections from two quadrants of two different trenches were selected for this index trench (Figures 4.9 and 4.10). It was not possible to excavate vertically in a major portion of trench 2XD1 due to the presence of a bathroom and part of a structure in its western half.

Layer 1

This layer was found in the NW corner of 2XD1, which is on the junction of Locality 1 and 2. It is a typical habitation layer, gray in colour and heterogeneous in composition. Due to ploughing, the upper part is highly disturbed. Its average thickness is 27cm.

Layer 2

This layer is mixed, including mud-brick wall, patches of grayish habitation deposit, and other materials. It is heterogeneous and loose in composition. It has been disturbed by insect holes. Its cultural material is negligible. Its average thickness is 15 cm.

Layer 3

This layer, which is uneven on top but horizontal at its base, is made of uniform mud-brick wall material. It is compact, yellowish in colour and homogeneous. Its average thickness is 22 cm.

Layer 4

This layer is a thick habitation layer composed of ash and mud-brick wall material. It is horizontal both on top and bottom, gray-yellow in colour and loose in composition. It contains a few potsherds, bones and numerous small kankars and pebbles. Its average thickness is 40 cm.

Layer 5

This layer is almost parallel to Layer 4 but more

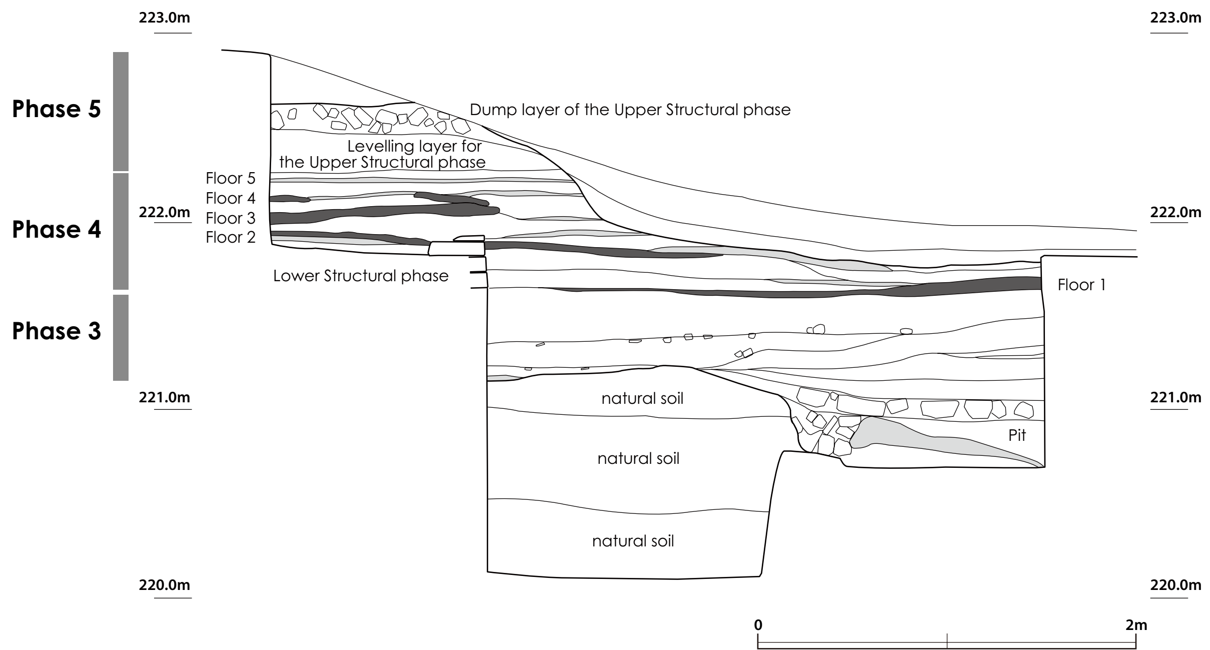


Figure 4.9 Cross-section of Trench 2XD5 facing north (1:40)



Figure 4.10 Index Trenches 2XD1 and 2XD2 on the junction of Localities 1 and 2 on the eastern side of the settlement showing cultural debris, stratigraphy and features

compact and uniform. Towards its western end it is destroyed by a depression. It contains horizontal ash lenses in its upper part and base. Its average thickness is 22 cm.

Layer 6

This layer is made of wall material, which is hard, sticky, homogeneous but has developed vertical cracks at intervals. It is light gray in colour and almost devoid of cultural material. Its average thickness is 28 cm. This layer appears to be a part of a platform found in the remaining portions of the trench.

Layer 7

This layer is loose and disturbed, containing wall material towards its eastern side and ashy material towards its western side. It has been disturbed by insects. It contains a few pebbles and potsherds. Towards the eastern part it is yellow whereas it is gray in the western part. It is highly loose with an average thickness of 17 cm. At the base of this layer at a distance of 1.52 m to the east of the northwest corner is a large pit that was a part of pit dwelling.

Layer 8, 9, 10 and 11

These layers are inside the pit dwelling and represent the accumulation of material during different time periods after its abandonment. Layers 8 to 11 are all loose in composition and made of typical garbage material. Because they were deposited at different times with different material their composition and colour differ.

Layer 12

This layer is the first occupational deposit at the site, largely characterized by virgin soil. Some material may have percolated down from layer 7 and mixed with the natural level. The colour of this layer is therefore ashy, homogeneous and compact but devoid of any cultural material. Its average thickness is 26 cm.

Layer 13

This layer is a typical fine sand deposit.

5 CULTURAL SEQUENCE

The ancient site of Farmana is located on an elevated natural sand and silt deposit, which forms Layer 13. Above this is a habitation deposit, which has survived in thickness between 2.5 to 3.5 m. This deposited is comprised of twelve layers that break down into two periods of Harappan culture. They are as follows:

Period- I Early Harappan (Regional Hakra Culture Tradition) (3500-2600 BC)

This period was labelled Pre-Harappan in the Farmana excavation report published last year (Shinde *et al.* 2008b). However, after evaluating its contribution to the development of Mature Harappan Period, it was clear that many of its elements continued into the succeeding phase as they were, or with only minor modifications. Because of this, this period is instead treated as a formative stage of the Harappan Culture. Hence, the term Early Harappan is now used. The last three layers at the site (Layers 10-12) belong to the Early Harappan phase (Period- I). The following are some of the AMS dates from the Early Harappan levels from Farmana, Girawad and Mitathal.

These dates are not consistent and are of limited value in determining the general chronology of Period-I. There are a number of dates from the early occupation at the site of Bhirrana, which is closest to Farmana and Girawad. Most of the Early Harappan dates are quite early at Bhirrana. It is therefore safe to presume that the Early Harappans flourished in this part of the Ghaggar Basin beginning in the middle of 4th millennium BC and continued until the emergence of the Mature Harappan Period.

Early Harappan pottery, structures, and other cultural material recovered from Farmana is similar to that which has been recovered from other sites in the Ghaggar Basin, including Bhirrana (Rao *et al*. 2004-05), Girawad (Shinde *et al*. 2008a) and Kunal (Khatri and Acharya 1995). The evidence from these sites suggests that the early settlers began their lifestyle with modest dwellings consisting primarily of subterranean or pit dwellings, either circular or oval in shape, that were dug into virgin soil. The pit dwelling excavated at Farmana is oval in shape, large in size, and 90 cm deep. The sides are perfectly vertical and it has a flat bottom. A couple of post-holes were identified on its periphery, suggesting the presence of superstructures over these pit dwellings. Charred bones, cooking pottery vessels, and fine wares recovered from within the pit dwelling is indicative of its use for dwelling purposes.

The Early Harappans used advanced pottery making and firing technology, producing a variety of wares such as Mud Appliqué, Incised, Chocolate Slipped, Reserve Slipped, Grooved, and others. Copper and lapidary crafts were well developed and Early Harappans had apparently already developed long-distance trade contacts for acquiring suitable raw materials and circulating finished goods. This suggests that the first settlers came to the site from elsewhere with ready craft technology. The excavation carried out at Farmana and a few other sites in the Ghaggar Basin reveal that the Early Harappans remained rural for a long period of time, and urbanization was a gradual process, fully achieved only in the Mature Harappan phase in the middle of the third millennium BCE.

As limited excavation was carried out in the early levels at the site it is difficult to discuss their life-style, including social and economic aspects.

Period- II Mature Harappan (sub-divided into Period-IIA, Period- IIB and Period-IIC)

The Mature Harappan Period at Farmana is represented by a thick deposit of more than two meters. A large number of artefacts, pottery, structures and features from this period have been excavated. There appears to be some variation in the beginning to the end of the Mature Harappan occupation at the site. This variation, coupled with stratigraphy, enabled identification of several sub-phases. This sub-phase is most apparent in their burials. The Mature Harappan has therefore been sub-divided into Period- IIA, Period-IIB and Period-IIC. No radio carbon or AMS dates are yet available, but on the basis of the cultural materials identified at the site as well as comparative analysis of this material with that found at other sites that have been tentatively dated, Period-IIA falls between 2600-2400 BC, Period-IIB from 2400-2200 BC, and Period- IIC, which has been completely removed from the site, can be dated between 2200-2000 BC. This division of the Mature Harappan Period and the absolute dates that have been assigned will have to be supported by additional data and dates. Tentatively, layers 6-9 could be assigned to Period-IIA and 1-5 to Period-IIB. No layers of the last Mature Harappan period have survived at the site.

The Mature Harappan Period marks the culmination of the cultural process that began in the early period at the site and is reflected in their settlement plan and cultural material. The entire 18 ha area of Farmana was occupied during this period, suggesting an increase in its population and the attainment of prosperity. There is a gradual transition from Early to Mature Harappan, which is clearly evident in their structures and pottery. The pit dwelling identified at the site's lowermost levels was replaced by mud-brick rectangular structures in the subsequent levels. Between the pit dwellings and the beginning of the Mature Harappan Period are a number of floor levels, indicating gradual

development. In the level between the Early Harappan and Mature Harappan, which can identified as a Transition Period, are found small rectangular, possibly independent structures with circular fire places.

Elaborate remains of well-planned mud and burnt-brick structural complexes, streets, rectangular fire places and storage areas appear at the beginning of Period-IIA. Bricks with the ratio of 1:2:4 were used during the Early Harappan Period and continue to be used until the end of Period-IIB. The so-called Early Harappan brick ration of 1:2:3 is almost entirely absent in the Ghaggar Basin, except at the site of Banawali in the Hissar District (Bisht 1993), which was excavated on a large scale. Extensive horizontal excavation of Period-II remains has revealed a well-planned settlement during the Mature Harappan period at Farmana. The excavation has provided a very good account of structural development activities beginning in Period-I (Regional Hakra Culture Tradition) and continuing into Period-II (Mature Harappan). The first settlers, as the evidence suggests, built subterranean circular or oblong structures, referred to as pit-dwellings (Shinde *et al.* 2008a). Gradually these structures were replaced by rectangular structures that continued to develop. The culmination of the development of these rectangular structures appears with the emergence a well-planned town in Period-II, around 2600 BC.

The partially handmade and Hakra type pottery assemblage along with local forms found in the Early Harappan Period was gradually refined to form part of the superior Mature Harappan Period assemblage, replete with typical Harappan shapes. The classic painted Harappan Red ware makes its appearance. Seals, completely absent in Period-I, begin to appear from the beginning of Period-II without any evidence of gradual development. Elaborate evidence for town planning, presence of seals and sealing, rich cultural material with evidence of advance technology, and elaborate burial customs are all hallmarks of Period-II, pointing towards the rise of an urban civilization up during this period.

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CHAPTER 5

STRUCTURAL REMAINS IN THE SETTLEMENT AREA

BY VASANT SHINDE

1 STRUCTURES AND FEATURES OF THE EARLY HARAPPAN PHASE (PERIOD- I)

Architectural data from Bhirrana, Girawad and Farmana, all of which are located in the Ghaggar Basin, suggests that the people from the Regional Hakra culture lived in shallow pit-dwellings. Excavations at Bhiranna (Rao *et al.* 2004) and Girawad (Shinde *et al.* 2008a) have produced evidence of extensive pit-dwelling complexes. Each of these complexes consisted of features like storage pits, garbage pits, water pits and storage pots. Each complex also possessed an open space that appears to have been used for domestic activities. Similar albeit informal complexes are built by migrant labourers in parts of central India today. The Girawad excavations produced evidence of pit-dwellings and mud-brick structures on the same

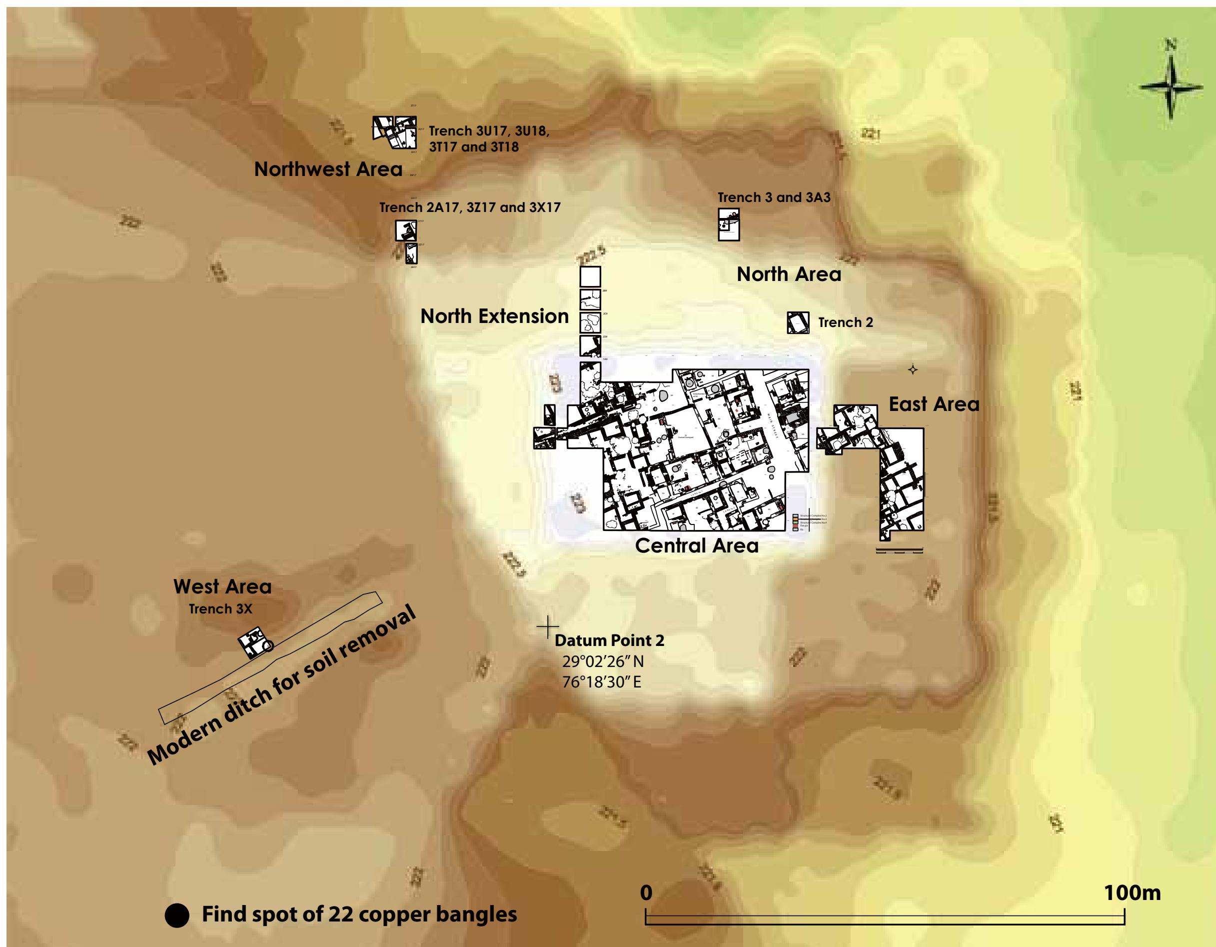


Figure 5.1 Structural remains on the Settlement Area

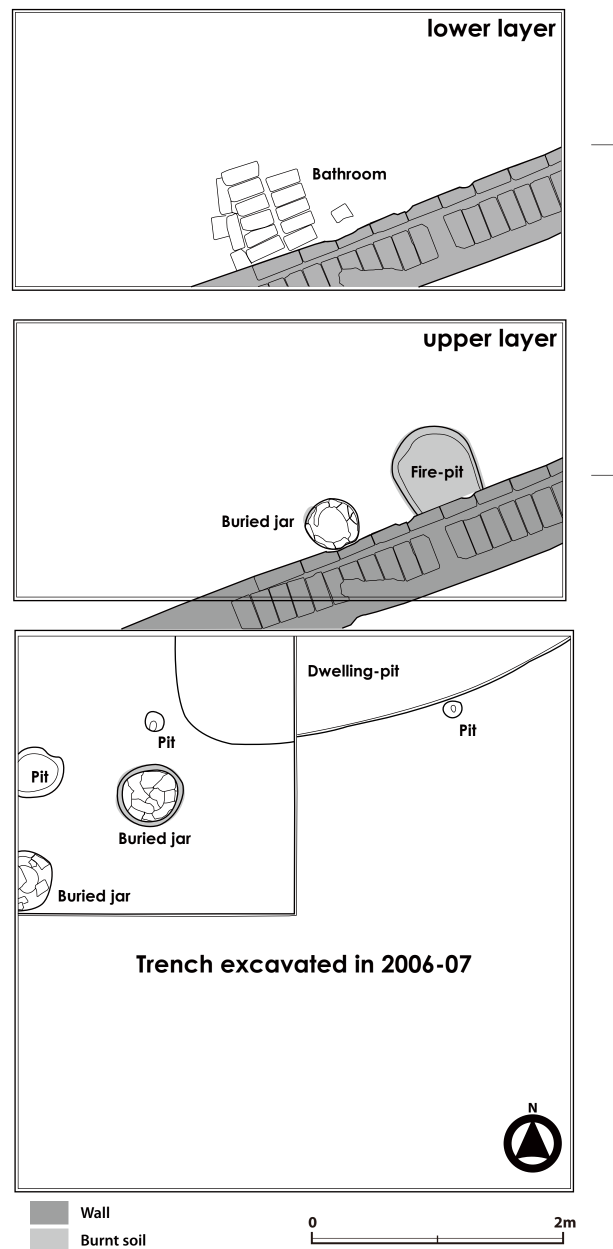


Figure 5.2 Plan of structural remains in Trenches 3 and 3A3 (North Area) (1:60)

occupation level. This major find suggests that the occupants of Girawad used pit-dwellings and mud-brick structures simultaneously. Additionally, Girawad produced evidence that the Regional Hakra Culture was a class-structured society. Pit-dwelling complexes were probably occupied by craftsmen, mainly potters, as indicated by the discovery of three nearby pottery kilns (ibid).

Remains from the Regional Hakra culture were recovered in Index Trench no. 3 at Farmana (Figures 5.2 and 5.3). These remains consisted of ceramics and pit-dwellings that are similar to those that were found at Girawad and Bhiranna in the Fatehabad District of Haryana. While its presences is clear, the exact spatial extent of the Regional Hakra culture phase at Farmana cannot yet be ascertained. The evidence produced by Index Trench No. 3 are as follows.

Three storage pots and one small cylindrical storage pit were discovered in the western half of this trench. Two of these pots and the storage pit in the section were in a straight line. Of the two pots in the section, one was located at a distance of 1.70 m to the north of the southwestern corner. This pot was partially exposed. It is a medium-sized Red ware globular



Figure 5.3 Structural remains in Trench 3



Figure 5.4 Cross-section in Trench 3



Figure 5.5 Large pit (dwelling pit) in Trench 3

storage pot. The other pot was found 35 cm to the north of the first pot. It is similar to the first pot, but had been later filled with burnt clay lumps. The cylindrical storage pit is located 45 cm to the north of the second pot. It is circular in plan. It has a diameter of 37 cm and is 50 cm deep. Its sides are perfectly vertical and its bottom is slightly concave. This feature seems to be a small storage pit which was which was used for dumping materials at a later point in time. The third pot is located 45 cm to the east of the cylindrical storage pit and is similar to the other two pots. It is also globular, slightly thick in section, with a circumference of 45 cm. It appears that the lower halves of all three pots were probably placed in a depression. The surface of the clay-lined concavity in which the pots were placed is burnt red. It is quite likely that an attempt was made to harden the surface of the recesses by burning them.

Pit-dwelling in Index Trench no.3
(Figures 5.4 and 5.5)

Along the northern section was an oblong pit (the major portion of the pit lies to the north of the trench and was not exposed). It is located 1.50 m to the east of the western section. The pit is oriented 40° from southwest to northeast. It is 3.20 m long and was excavated to a width of 90 cm. The pit was dug by the earliest occupants of the site, extending beneath the base of layer (8) into natural soil. The sides are perfectly vertical and smooth whereas the base is slightly concave in the middle. Two post-holes were identified along the southern margin. The arrangement and quality of the sides and bottom of the pit, along with the placement of post-holes on its souther margin, indicate that the feature was a pit-dwelling similar to those found in the earliest occupation levels at Kunal (Khatri and Acharya 1995).

2 STRUCTURAL REMAINS OF PERIOD- IIA

To investigate town planning in Farmana's Mature Harappan period, the team decided to excavate a large horizontal area that dates to Period- IIA. This large-scale operation also produced a large amount of data relevant to the development of Mature Harappan structures and activity areas. Areas where the farmers had already dug deeply into the mound were selected for this phase of the project, as deposits from later periods had already been removed. Thus, the area towards the north and east of the Locality 1 was subject to extensive horizontal excavations.

All the structures found at Farmana in Periods IIA-IIB were made of mud-bricks. Occasionally burnt bricks were also added to structures, but their use was mainly restricted to the construction of building foundations or strengthening walls. As stone for building material is not available in the surrounding region the structures were made of high quality bricks of yellowish and brownish colour. The dimensions of all the bricks used at the site conform to the traditional Harappan ratio of 1:2:4. A variety of brick construction techniques were employed, but many of the structures utilized the header and stretcher technique attested to at other Harappan sites. In many cases, builders added an additional border to the structures' walls by laying bricks horizontally along the edges. Considering the extremely thick walls of the building complexes (example), it is even possible that some of the structures were double-storied buildings. An alternative explanation for the walls' thickness is insulation. Constructing thick mud or mud-brick walls for warmth in the winter and coolness in the summer continues in Haryana villages to this day. The Harappans were probably aware of the advantages such thick walls provide. The foundations of the buildings were also constructed of mud-brick. Burnt bricks were sometimes used to construct bathing platforms and drainage canals.

The plan of the Mature Harappan settlement at Farmana appears to have been established during Period-IIA. The settlement consisted of a main street, small streets and lanes, and massive structural complexes neatly arranged along their margins. The town was laid out along a grid oriented in the NW/SW direction. Each structural complex consisted of numerous rooms of different shapes and sizes. The artefacts and features found in these rooms indicate that they were used for dwelling, storage and cooking purposes. Inside the structural complexes, excavators identified single, double or triple fire-pits that were perfectly rectangular. These were accompanied by a number of jars. Usually, a complex was built around an open courtyard. A number of complexes from both Period IIA and IIB have been excavated. The settlemen plan is a parallelogram, oriented in the northwest-southeast direction. This pattern was established during Period-IIA and continued in IIB without any change. During the course of excavation a number of structural phases were identified, particularly in Index Trenches. However, the only area excavated on a large scale belonged to Period IIA and assigned the label Structural Phase- 1. The other exposed phase, Structure Phase- 2, dates to IIB.

The following pages consist of descriptions of the structures and features excavated at Farmana. They all belong to the Structural Phase-1, Period-IIA.

Structure No.1 (Trench No.2)

(Figures 5.6 - 5.8)

At the base of layer (3) a mud-brick structure oriented 30° in the southeast-northwest direction was encountered. The team believes this to be a roughly rectangular residential structure. Only its foundation was preserved. The plan of the structure was nearly complete, and all four of its walls were exposed. From the inner side it measures 3.60 m from north to south and 2.60 m from east to west. The northern wall of

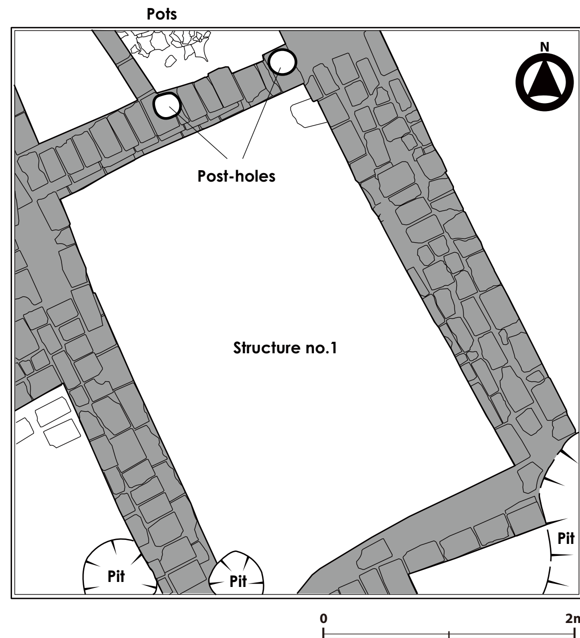


Figure 5.6 Structural remains in Trench 2

the structure, which is survived only by a single course of bricks, is 2.20 m long, 30 cm wide and was preserved to a height of 34 cm (including of foundation). The house was provided with a broad foundation, evident in the northern, eastern, and western walls. Two post-holes were found on top of the northern wall. The southern wall has been identified along the southern section. There appears to be an entrance (65 cm wide) in the southwest corner of the structure. The total length of the wall is 2.65 m and is 35 cm broad. The foundation and course of the southern wall are symmetrical overly each other, unlike the northern wall. The bricks were set in yellow mud mortar. The southeast corner of the structure has been damaged by later pits. The eastern wall, 4.45 m in length and 70 cm broad is survived to a height of 50 cm. Two courses of mud-bricks survived in the eastern wall. One post hole on its inner side of the wall was identified. The western wall of the structure, which was well preserved, is 3.85 m long and 40 cm broad. It has survived to a total height of 22 cm. This wall continues beyond the corner towards the northern side suggesting the presence of additional rooms.

The floor of the structure has been damaged, but some portions on the outer side of the structure have survived. These are well-made with bricks and clay. Inside the structure almost at the center, a typical Harappan steatite seal was discovered (Figure 7.5). The seal's engraving consists of a water buffalo motif and a few Harappan sings running along the upper edge. Outside the northern wall of the structure are the remains of a large dish-on-stand and a couple of medium-sized globular pots (Figure 5.8). In all probability, this was a domestic structure, of which only one chamber has been excavated.

Structural Remains in Trench 3X
(Figures 5.9 - 5.11)

Trench 3X is located in Locality 3, 117 m to the west of the Datum Point, close to the middle of the deep ditch dug by the owner of the field to cart soil from the habitation. The main aim of this trench was to excavate the pits and pit-dwellings visible along the cut section of the ditch. The farmer removed the upper deposit of the habitation debris during plowing, hence much of the deposit from the Mature Harappan Phase has been razed. Only a thin deposit of the early Mature Harappan survived above the Early



Figure 5.7 General view of St. no. 1 in Trench 2, from east



Figure 5.8 Pottery *in situ* associated with St. no. 1 in Trench 2

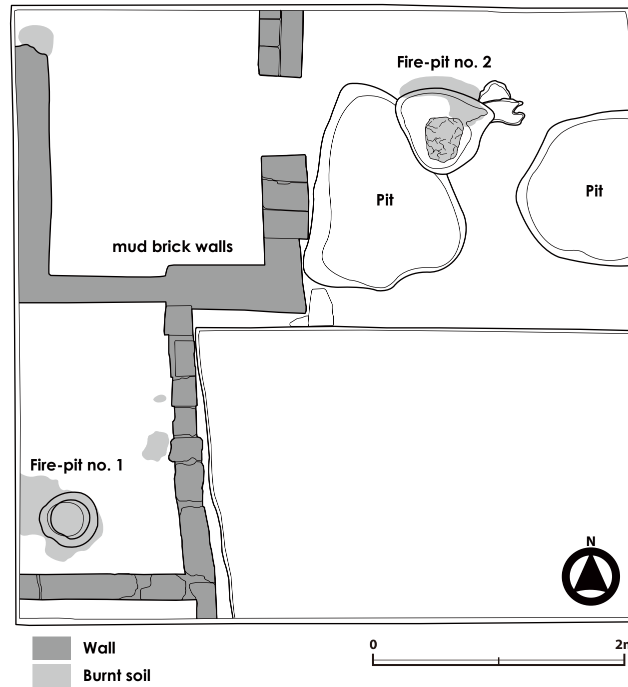


Figure 5.9 Structural remains in Trench 3X (West Area) (1:60)

Harappan Hakra Culture Tradition (Period I). The remains excavated in this trench belong to the transition from Early to Mature Harappan at the site. Immediately below the surface at a depth of 30 cm, the team found a mud-brick structure, which has partially survived. This structure is located in the NE, NW and SW quadrants of Trench 3X (Figure 5.9). Parts of the southern, western and eastern walls have survived, all of which are made of a single brick line. The structure belongs to the Mature Harappan period, indicated by the presence of typical Harappan pottery and the ratio of the mud-bricks used in its construction (1:2:4).

The southern wall of this structure has survived to a length of 1.65 m and runs in the north-south direction. Its average width is 40 cm and runs along the southern section of the trench. Only the basal course of the wall has survived. The southern part of the eastern wall of the structure, located 1.60 m to the east of the western section of the trench, runs straight in the north-south direction for a length of 2.80 m, then takes a 90° turn and runs straight towards the east for a distance of 90 cm. It continues in the east-west direction, where a length of 2.05 m has been exposed. In the centre of the surviving wall at a distance of 90 cm is an opening that is 85 cm in width. The average thickness of this wall is 35 cm. The northern wall is confined to the northern side of the trench along the northern margin. It is exposed to a length of 2.35 m. The total width of the exposed wall measures 25 cm. There appears to be a partition wall in this structure. It is located 2.50 m to the north of the southern section. It is 1.95 m in length and 25 cm in width. The structure has two rooms. An area 2.50 m from north to south and 1.50 m from east to west was exposed, revealing one of the rooms on the southern side. A circular underground fire-pit (Fire-pit no. 1) was found in this room. It is 66 cm to the north of the southern section and 23 cm to the east of the western section. This fire-pit was constructed *in situ* in a cylindrical pit of double clay rings, the inner being 3 cm and the outer 5 cm in thickness. The inner diameter of the fire-pit is 30 cm and has survived to a depth of 15 cm. The perfectly vertical sides and the flat bottom are plastered, which have been burnt red due to constant use. Inside the fire-pit was found ash and burnt black clay. This part of the structure was probably a kitchen (Figure 5.10).

The room of the structure located to the east of



Figures 5.10 Mud brick wall and Fire-pit no. 1 in Trench 3X, from west



Figures 5.11 Fire-pit no.2 in Trench 3X, from west

the one described above is 1.95 m (inner edge) and 2.20 m (outer edge) in width and was exposed to a length of 2.05 m (inner) and 2.40 m (outer). Both the rooms have very well constructed plastered floors. Another fire-pit (Fire-pit no.2) was found on the outer side of the above room to its east, which is roughly circular in shape (Figure 5.11). It is located 80 cm to the east of the eastern wall of the room and 60 cm to the south of the northern section. There is a partially cut clay stump in the center of the fire-pit. The fire-pit has survived to a depth of 15 cm and its sides and bottom are made of clay, which have turned brick-red due to intense burning. The clay stump inside is roughly rectangular in shape, measuring 40 cm from north to south and 25 cm from east to west. This fire-pit appears to have been a domestic oven. The clay stump inside may have been used for supporting cooking vessels. Similar fireplaces have been reported from the Chalcolithic site of Inamgaon in the Deccan region, dated to the middle of second millennium BCE (Dhavalikar *et al.* 1988).

Structural Remains in Trench 3A3

(Figures 5.2, 5.12 and 5.13)

Trench 3A3 was laid out immediately to the north of Trench 3 with a view of tracing the plan of the dwelling-pit partially excavated in Trench 3 during the 2006-07 season (Figure 5.2). On the baulk of these two trenches, a mud-brick wall running in the southwest-northeast direction was discovered. The section of this wall that falls in the NW quadrant of Trench 3 was accidently cut during the 2006-07 season. However, it was possible to expose more of it in the southern half of Trench 3A3. It was found just 15 cm from the surface. The wall continues further towards the east. It has been excavated to a length of 3.75 m and its average width is 50 cm. The wall has survived to a thickness of 70 cm, seven mud-brick courses of which are visible.

Along this wall to the north are located two features in a row, a fire-pit and a storage jar (Figures 5.12 and 5.13). The fire-pit, roughly squarish with its northern edge in a semi-circular form, is located 1 m to the west of the eastern section along the wall. It is very shallow (7 cm) and measures 60 cm from east to west and 65 cm from north to south. The sides and the flat bottom are smooth and burnt black. To its west at a distance of 40 cm is a globular jar of sturdy Red ware (Figure 5.12). It is medium thick in section, the upper half and the base of which are missing. Its diameter at the waist is 45 cm.

Immediately to the north of the wall described above, part of a western wall along with the possible remnants of a bathroom were exposed (Figure 5.13). The western wall, which has survived to a length of 1.40 m, runs in the slightly southeast-northwest direction. The remaining portion of the wall has been cut by a later pit. The wall is 50 cm broad. The southwest corner of the structure contains features consistent with a bathroom, including wedge-shaped burnt bricks arranged in opposing directions. The average size of the bricks is 26 cm in length and 13 to 10 cm in width. The remains of the bathroom have survived over an area of 66 cm from east to west and 72 cm from north to south. The burnt bricks had been set in mud mortar and arranged in such a way that it slopes towards the east and merges with the floor. The floor of the structure is very well made, consisting of alternate layers of clay and silt, rammed hard and plastered. The inner portion of the main wall, which runs roughly in the southwestern-northeastern direction is lined with 5 cm of thick plaster. To the west of the western wall is a mud platform, which measures 1.40 m from north to south and is exposed to a maximum length of 1.25 m. It continues further towards the west in another portion. The thickness of the platform is 30 cm.



Figure 5.12 Mud brick wall and two features in the upper level of Trench 3A3, from southeast



Figure 5.13 Bathroom with baked bricks in the lower layer of Trench 3A3, from northeast

Structural Remains in Trench 2D9

(Figure 5.14 and 5.15)

This trench is located north of Locality 1. Only a single structure was partially exposed in this trench.

Structure Nos. 7A and 7B

To the north of the Index Trench 2D9-1A9 were found two rooms of single structure which has been labelled Structure No. 7A and Structure No. 7B (Figure 5.15). This structure dates to the middle phase of the Mature Harappan Period. As it is close to the surface (20 cm) the walls have been flattened and damaged. The walls are made of mud-bricks.

Structure No. 7A

This is a small room to the east of the complex located along the eastern margin of the trench (Figure 5.15). Only part of this structure has been excavated, with material exposed over an area of 1.50 m from north to south and 1.00 m from east to west. Though it is a small compartment it has a thick western wall, which has been excavated fully. The wall is 3.05 m in length and its average width is 65 cm. It has survived to a thickness of 8 cm. Two postholes were identified in this wall- one at the northern corner with a diameter of 20 cm and the other towards its southern side, located 1.60 m to the south of the first posthole. The second posthole is in the middle of the wall and has a diameter of 24 cm. Parts of the northern and southern walls have been excavated. The northern wall was excavated to a length of 1.62 m and is 60 cm in width. It has survived to a thickness of 8 cm. The southern wall, which is 1.05 m wide, has been excavated to a length of 83 cm and has survived to a thickness of 8 cm. The eastern portion of the structure has not been excavated and therefore its exact dimension cannot be identified. Considering its small size, this structure may have provided storage for the complex.

Structure No. 7B

This structure is located to the west of Structure No. 7A, the southern wall of which has been partially exposed (Figure 5.15). This wall, which has been damaged by later pits, was exposed to a length of 4.10 m. It has an average width of 60 cm. It has survived to a thickness of 8 cm. There is a posthole in the wall towards its eastern end which is located 87 cm to the west of the eastern end and 17 cm to the north of the southern margin. It has a diameter of 17 cm and a depth of 14 cm. The western wall of Structure No. 7A forms part of the eastern wall of this structure. Inside the structure is a well-made floor of clay that has been damaged by a number of later pits. As the other walls cannot be clearly discerned, the function and dimension of this structure are not clear. The area over which the structure is exposed measures 3.70 m from east to west and 3.30 m from north to south. Considering the size of this structure, along with its well-made floor, it was probably dwelling part of the complex.

Structural remains in the eastern part of Locality 2

(Figure 5.16 - 5.51)

This area was selected for excavation to study the layout and structures of Period- IIA. The materials from the index trench have clearly demonstrated that the structure remains of Locality 2 belong to Period- IIA. It was noticed that right from the beginning of Mature Harappan Period, the settlement was well planned and conformed to a grid pattern. The structures from the beginning of the Mature Harappan (Period- IIA) are orientated 25° in the northwest to southeast direction, a construction practice which continues in the subsequent phase (Period-IIB). In all, five complexes have been excavated. The resulting exposures indicate that the structures at Farmana are located along and either

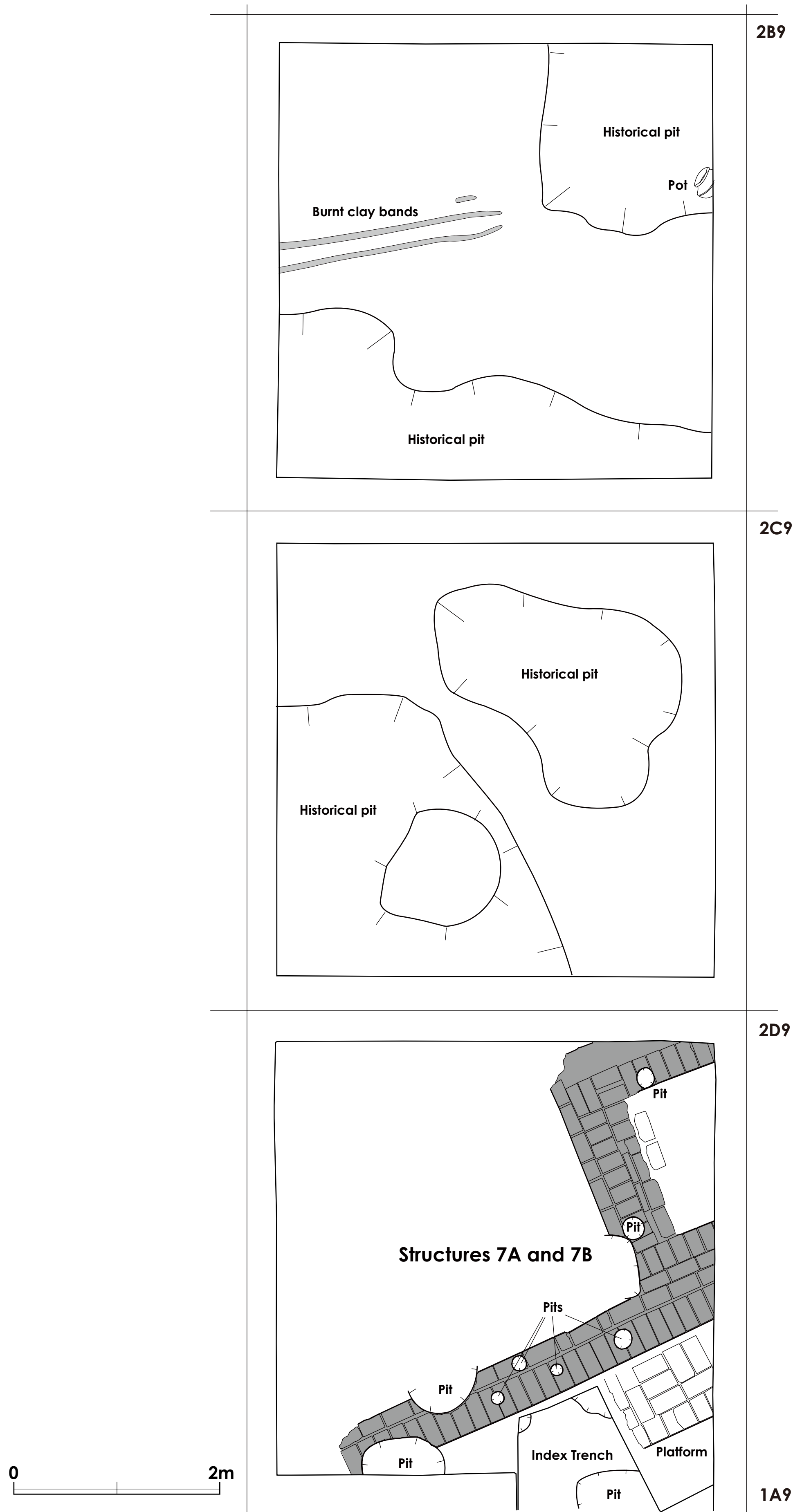


Figure 5.14 Structural remains in North Extension (1:60)



Figure 5.15 Structures 7A-7B, Structural Phase I, Period IIA

side of the town's streets and lanes (Figures 5.16 - 5.20). The bricks used during Period- IIA follow the typical 1:2:4 ratio and come in two sizes- 32 × 16 × 8 cm and 30 × 15 × 7.5 cm. These sizes were used throughout the Mature Harappan period at the site, although a smaller brick size measuring 28 × 14 × 7 cm was also introduced and used sparingly for construction, continuing through the occupation's durection. The following five complexes of Period- IIA were partially excavated:

Structure Complex 8
(Figures 5.21 - 5.23)

This structure complex (Figure 16) was excavated immediately to the east of Structure Complex 2 of Period- IIB, which was excavated in 2007-08. It was found at a lower level. In all, four rooms from this complex have been partially exposed and a major portion of the complex extends into the Northern and Western sections of the trenches. The structures from this phase are relatively well preserved since they are at a lower level.

Structure No. 8A

This structure was found in the southeast quadrant of Trench 2XD1 and the northeast quadrant of Trench 2XE1. A very small section of this structure located on the extreme western periphery of Locality 2 immediately to the east and at a lower level of Structure Complex 2 of Period- IIB has been excavated (Figure 5.22). Only parts of northern and eastern walls have been exposed. The northern wall was excavated to a length of 2.40 m on the eastern side, and continues further west. The wall is 72 cm broad and towards its western side in the section it has survived to a thickness of 80 cm. In all, eight brick courses have survived. This wall may have been rebuilt, as two construction phases are apparent. The lower 30 cm



Figure 5.16 Structural remains in East Area (1:200)

belongs to the early construction phase whereas the upper 50 cm belong to a later construction phase. The later phase wall is not exactly in alignment with the earlier one. It is off alignment by 10 cm, projecting towards the north. This structure has a very well made floor of complete bricks, which suggests that its owner was quite affluent.

Structure No. 8B

Structure 8B, which is located to the north of 8A in Trench 2XD1, is actually a bathing platform for Structure Complex 8 (see Figure 5.22). It measures 1.70 m from east to west and 1.45 m from north to sout. The eastern part of the northern wall of 8A forms the southern wall of the structure. The western margin is made of a single line vertically placed bricks, which is 1.60 m in length and 34 cm in width. Only the basal course has survived to a thickness of 5 cm. The size of the bricks used for construction is 34 × 17 × 8.5 cm. The northern margin of the bathing platform is 1.32 m long and 16 cm broad. Towards the eastern side it is attached to a drainage channel. Inside the enclosed

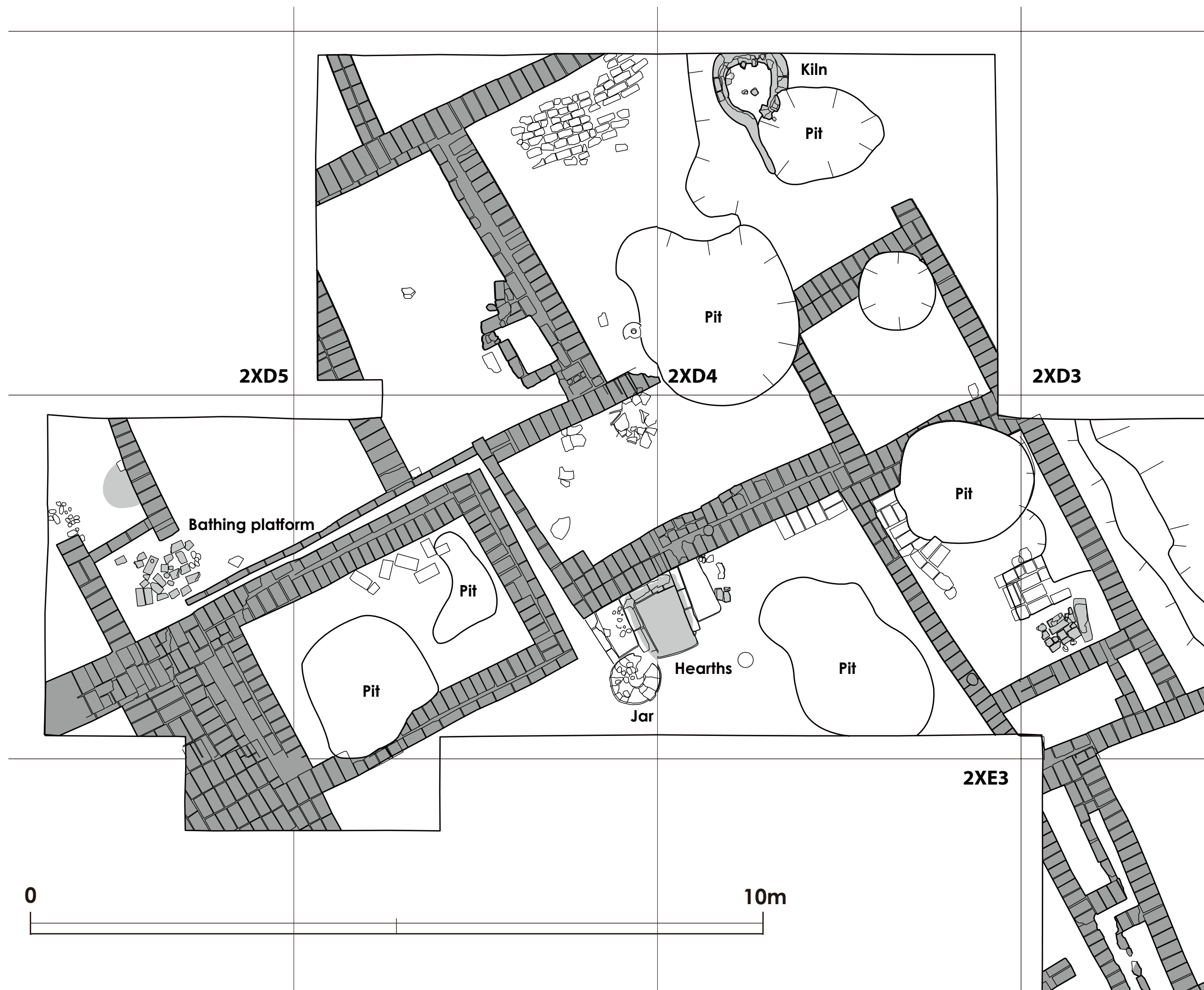


Figure 5.17 Structural remains in East Area (1:100)

area are scattered wedge or hedge-shaped burnt bricks used for the construction of the base of the bathing platform. This bathing platform is located inside Structure No. 8C.

Structure No. 8C

This room of the complex is labelled Structure 8C. It is located north of the bathing platform in Trench 2XD1, and has been excavated over an area of 1.70 m from north to south and 1.25 m from east to west (see Figure 5.22). Only a part of eastern wall of this structure has been excavated, exposing a length of 1.84 m. This wall is 32 cm wide and is survived by its basal course to a thickness of 8 cm. The size of bricks used for construction of this wall is 32 × 16 × 8 cm.

A small drainage channel emanates from the southeast corner of the bathing platform. It runs parallel to the outer face of the northern wall of Structure No. 8D. It runs straight east along the wall for 4.50 m and then turns towards south and runs parallel to the outer face of the eastern wall of Structure No. 8D. It is not clear where it ultimately ends, as the southern portion has not been excavated. Near the source (bathing platform) it is narrow (10 cm) and as it flows towards the east it widens gradually, becoming 22 cm at the end where it turns south (see Figure 5.22). At the end of the channel it becomes 37 cm wide.

Structure No. 8D

Structure No. 8D, which is to the east of Structure No. 8A, is very well preserved save for the central portion, which has been destroyed by a later pit. All the walls of the structure have been well preserved (Figure 5.23). The western wall of the structure is



Figure 5.18 Structural remains in East Area (1:100)

3.10 m long and 46 cm wide and has survived to a thickness of 23 cm, with three courses of bricks. The northern wall, which runs parallel to the drainage channel, is 4.42 m long, 50 cm wide and has survived to a depth of 25 cm. The eastern wall is 2.95 m long, 50 cm wide and has survived to a depth of 28 cm. The southern wall is 4.34 m long, 46 cm wide and has survived to a thickness of 25 cm. All four walls have survived to an even height, with three brick courses preserved. Within the structure along its northern inner margin, at a distance of 53 cm to the west of the eastern wall are a number of bricks from the wall that have fallen on the floor. The average size of the bricks is 32 × 16 × 8 cm. The structure has a well-made floor, suggesting that it could have been the dwelling part of the complex. However, a major portion has been destroyed by a large circular pit from a later date that has a diameter of 2.40 m. The pit is located towards the western side of the structure, 1.10 m to the west of the inner margin of the eastern wall. It has also damaged the inner face of the western portion of the southern wall.

Structure Complex 9
(Figures 5.24 - 5.37)

This is one of the largest complexes from Period IIA, located to the east, north and south of Structure Complex 8. Some portion of the complex has not yet been excavated. The rooms of the complex are of different sizes, some of which have been fully excavated and some only partially exposed.

Structure No. 9A
This structure is to the east of Structure No. 8D (Figure 5.25). In fact, both structures are separated from each other by a drainage channel that emanates from the bathroom of Structure No. 8C. This structure, though fully excavated, is damaged in the centre and at the northwest corner by a later pit with a diameter of 2.30 m. It is a narrow rectangular structure, which covers an area of 4.20 m from east to west and 1.70 m from north to south. The western wall of structure is very thin, made of a single line of vertically placed bricks. It is 2.80 m long and its width is 16 cm, with only the last course of bricks remaining to a height of 7 cm. The southern wall is 4.55 m long, 70 cm wide, and has survived to a height of 8 cm. A small portion (80 cm) along the eastern margin, 35 cm to the east of the inner face of western wall has been damaged due to later disturbances. The eastern wall, which is also made of a single line of horizontally placed bricks is damaged at its northern end by a later pit. Originally, it was 2.78 m long and 32 m wide, but has survived now only to a height of 8 cm. The northern wall (originally 4.75 m long), also made of single line of vertically placed bricks, has been destroyed on its eastern side by later pit. It is now 2.20 m long. The average width of the wall is 32 cm and has survived to the height of 8 cm. The structure has relatively well made floor, which is hard and plastered.

Inside the structure along its northern wall, 1.70 m to the east of the northwest corner is a large painted storage jar that has broken *in situ* (Figure 5.26). It appears to be large globular pot with possibly narrow flat base. It is profusely painted in black with plant and leaf motifs. This is a typical Harappan jar, closely resembling the pottery from the site of Harappa. To the west of this pot at a distance of 45 cm are fragments of large basin of deeply incised wares, scattered in the western part of the room over an area of 1.20 m from north to south and 1.05 m from east to west. A large rim fragment was found lying close to the inner margin of the western wall, 12 cm to its east and 67 cm to the north of the southwestern corner of the structure. The basin has a broad black band on the top of the rim, which is slightly flared and has a wide grove on its outer side. Inside are deeply incised lines 3 cm below the rim portion, which is spread over an area of 9 cm. Below that are a group of wavy lines that may have been made using a comb-like instrument.



Figure 5.19 Structural remains of Period IIA on the east of Locality 1



Figure 5.20 Structural remains of Period IIA on the east of Locality 1



Figure 5.21 Structure Complex 8, Structural phase I, Period IIA



Figure 5.22 Details of Structures 8A, 8B, 8C and the bathing platform and its drainage



Figure 5.23 Details of Structure 8D and the drainage



Figure 5.24 Structure Complex 9 in the foreground, Structural Phase I, Period IIA



Figure 5.25 Details of Structures 9A and 9B



Figure 5.26 Remains of painted jar and incised basin inside Structure 9A

This is one of the characteristics wares of the Early Harappan Hakra Period that continues into the Mature Harappan period in the Ghaggar basin. The structure has rough floor and considering the presence of two large jars and a narrow chamber like feature, it was probably used as a storage area of the complex.

Structure No. 9B

This structure is located to the south of 9A (Figure 5.25 and 5.27). It is partially excavated and appears to be a large kitchen for the complex. The western and southern walls of this structure have not been excavated, whereas the eastern wall has been exposed for a length of 4.70 m. This is a thin wall (28 cm). It has survived to thickness of 10 cm. This wall is made of single line of vertically placed bricks. The southern wall of Structure No. 9A forms the northern wall of the structure. Inside the structure is a large posthole, which is located 2.20 m to the west of inner face of eastern wall and 1.46 m to the south of the inner face of north wall. It has diameter 24 cm. To its east at a distance of 30 cm is a large irregular oblong pit that belongs to a later period (it is 2.84 m long and 1.75 m broad). This pit has destroyed a considerable part of the floor area. Within the structure are three fireplaces in an row, running from east to west along the inner face of the northern wall towards the western side. The western most fireplace is located in the northwest corner of the structure. It is 72 cm in length from north to south and the width varies from 46 cm in its northern end to 34 cm in the south. It has survived to a depth of 33 cm. This fireplace was not used as much as the central one, as its sides and bottom have not been burnt brick-red. The western wall of the middle fireplace, which is 15cm broad and 80 cm long, forms the eastern wall of the fire pit. The inner face of the northern wall forms the northern periphery, and it has a brick lined wall on the western side that is 70 cm long and 13 cm wide and has survived to a depth of 25 cm.

Immediately to its east is the largest fire pit, which is lined with bricks on all but the southern side, and is 90 cm in length from north to south and 65 cm wide from east to west. It has survived to a depth of 31 cm. Three courses of brick lining were apparent on its northern end. On top of the brick wall was a clay wall, which has survived to thickness of 15 cm. The thickness of the clay and brick wall is 15 cm. The eastern wall, which is 1 m in length, is slightly damaged towards its southern side. At the southern end of western wall lies large storage jar. The brick lining, clay wall, the flat clay bottom of the fire pit have been burnt brick-red, suggesting its constant and long use. Immediately to its east is one more fire pit, which is rectangular and measures 85 cm from north to south and 70 cm from east to west. It has survived to depth 25 cm. The eastern wall of the middle fire pit forms the western wall of this fire pit, whereas there was a brick lined margin that has been damaged. The inner face of the northern wall forms northern periphery of this fire pit. As is the case with the western most fireplace, this fire pit was not intensively used, as its sides and the bottom have not turned brick red.

At the southern end of the westernmost fire pit is a large storage jar of a fine red variety (see Figure 5.27). It is a large globular pot with a flat narrow base. The upper half of the pot is missing. The circumference of the pot is 77 cm, and it has survived to a height of 30 cm. The presence of a pot by the side or in front of fire place is a characteristic feature at Farmana. The storage jar, which is close to the fireplace, may have contained water that was kept warm by the indirect heat of fireplace, a necessity in this area, where winters are severe.

This structure appears to be a community kitchen, and considering the size and number of fireplaces, the number of people occupying the complex must have been quite large.

Structure No. 9C

Structure 9C is located north of part of



Figure 5.27 Details of fire pits and a storage jar inside Structure 9B



Figure 5.28 Details of Structure 9C

Structure Nos. 8D and 9A (Figure 5.28). This rectangular structure is well preserved and, except for its northwest corner, has been fully exposed. The western part of the northern wall of 9A forms a part of south wall of the structure for a length of 2 m. The remaining portion of wall (1.30 m) is made of a single line of vertically placed bricks. The total length of the wall is 3.30 m. The single line brick wall is 12 cm broad and has survived to a height of 20 cm. The eastern wall of this structure is 4.70 m long and 55 cm broad. It has survived to height of 20 cm, with two courses of bricks apparent. The north wall has been exposed to a length of 2.30 m and is made of a horizontally placed mud-brick line that is 40 cm broad. The size of the bricks used for constructing this wall is slightly larger (40 × 20 × 10 cm). The wall has survived to a height of 23 cm with three apparent courses of bricks. The area enclosed by the structure inside is 4 m from north to south and 2.25 m from east to west. It has a well-made floor that has developed depression at the centre.

Along its eastern wall, 40 cm to the north in the southeast corner is a rectangular fireplace, the longer axis of which is along the wall (Figure 5.29). The fireplace has brick lining on the north, west, and southern side whereas on the eastern side, the inner face of the eastern wall forms its boundary. The total area of the fireplace is 72 cm from north to south and 45 cm from east to west. It has survived to depth of 15 cm. The brick lining of the fireplace is disturbed. This structure was probably a second kitchen for the complex.

Structure No. 9D

To the north of Structure No. 9C is Structure No. 9D, of which only the southeast corner has been excavated (Figure 5.30). Part of the northern wall of Structure No. 9D has been exposed for a length of 1.20 m, whereas the eastern wall has been exposed for a length of 1.76 m. This wall is 32 m broad and has survived to height of 20 cm. It has a well-made floor of plastered and rammed clay A major portion of the structure extends towards the north.

Structure No. 9E

To the east of Structure No. 9D and northern section of Structure Nos. 9C and 9F is located Structure No. 9E (Figure 5.30). Parts of the northern wall of Structure Nos. 9C and 9F form the south wall of this structure, which was exposed to a length of 3.36 m. This entire wall is made of horizontally placed bricks that measure 40 × 20 × 10 cm. It is therefore 40 cm broad and has survived to a height of 18 cm. The eastern wall of the structure has been exposed to length of 1.75 m. As only a small portion near the southwest corner of the structure has been excavated, its exact function cannot be determined.

Structure No. 9F

To the east of Structure Nos. 9C and 9A is located structure Structure No. 9F (Figure 5.31), which is identical to Structure No. 9C. A major portion of this structure lies towards the southeast, and its eastern margin is damaged due to later pits. A small portion of northeast corner of this structure has not been exposed. The eastern wall of Structure No. 9C forms the western wall of this structure. The northern wall of Structure No. 9C continues east and forms the north wall of this structure, which is exposed to a length of 2.60 m. Since this wall is made of horizontally-placed bricks that measure 40 × 20 × 10 cm, its width is 40 and it has survived to a height of 14 cm. The western part of the northern wall of Structure No. 9A forms 3.30 m of the southern wall of this structure, and the north wall of Structure No. 9G forms the remaining 2.20 m. The total length of this wall is 5.50 m. The eastern wall has survived for a length of 90 cm. A major portion on the north has been destroyed by a later pit, which has a diameter of 1.70 m. This wall is 32 cm broad and has hardly survived to a height of 2-3 cm. This structure has a well-made floor of plastered clay. In the northern



Figure 5.29 Details of a fire pit inside Structure 9C



Figure 5.30 Details of Structure 9D and 9E



Figure 5.31 Details of Structure 9F



Figure 5.32 Details of a kiln within Structure 9F

half of the structure, over the floor, lies debris from a collapsed brick wall spread over an area of 1.60 m from north to south and 2.45 m from east to west.

Inside the structure near its northeast corner is a circular feature that was most probably a tandoor (Figure 5.32). It is located 2.30 m to the north of the southern wall and 40 cm to the west of the eastern wall. It is made of bricks which have been chiseled from the inside to form a circle. At least 2 courses of bricks are visible towards its western side. The diameter of the feature is 1.05 m and the average thickness of its walls is 8 cm, which has survived to a depth of 15cm. Part of its southern periphery has been damaged by a later pit, which has damaged a major portion of the eastern wall. The sides and bottom of this feature are burnt red. In fact, the inner clay plaster of this feature has vitrified due to intense heat. This feature does not appear to be a domestic tandoor but could be associated with some kind of industrial activity on the site.

Structure No. 9G

This is a small square structure located to the east of Structure No. 9A (Figure 5.33). It has been damaged near its northeast corner by a large circular pit, which has diameter 1.10 m. Also, part of its southern wall is damaged by another circular pit, which has a diameter 1.75 m. The total area enclosed by this structure measures 1.95 m from east to west and 1.75 m from north to south. The eastern wall of structure Structure No. 9A forms the western wall of this structure. The northern wall is 2.50 m long and its width is 50 cm. It has survived to maximum height of 8 cm. The northwest corner of this structure has been destroyed by another large pit, which has damaged a major portion of Structure Nos. 9A and 9F. The South wall is 2.50 m in length and its average width is 45 cm. It has survived to height of 6 cm. The eastern wall is 2.75 m long, 32 cm wide and has survived to a height of 5 cm. This wall is made of a single row of horizontally placed mud bricks that measure 32 × 16 × 8 cm. The structure has a rough but well made floor and could have been used as storage by the people who occupied this complex.

Structure No. 9H

This structure is located to the east of Structure No. 9B. It is a rectangular structure with a small antechamber towards its southern end (Figure 5.34). The area enclosed by this structure is 3.15 m from north to south and 2.10 m from east to west. In its northern part is a large circular pit from a later date, which has damaged a major portion of the floor and part of the inner face of the wall. The east wall of Structure No. 9B forms western wall of this structure. The total length of the east wall, including antechamber area, is 5.25 m. It is 32 cm wide and has survived to a thickness of 10 cm. This wall is made of a single row of vertically placed bricks that measure 32 × 16 × 8 cm. The southern wall, excluding the antechamber, is also made of a single line of vertically placed bricks that measure 30 × 15 × 7.5 cm. It is 2.55 m long, 30 cm wide and has survived to a height of 20 cm. The southern wall of Structure No. 9G forms the northern wall of this structure.

It has a very well made floor lined with bricks that have survived over an area over of 1.45 m from north to south and 1.20 m from east to west, while the remaining portion has been destroyed by later disturbances. Along the eastern and western walls in an area measuring 1.80 m to the east and 1.55 m to the west consists of debris from a fallen wall.

In the southeast corner is a small rectangular fireplace (Figure 5.35), which is located 20 cm to the north of the southern wall and 55 cm to the west of the eastern wall. The total area of the fireplace, which runs parallel to southern wall, measures 55 cm × 45 cm. This fireplace is lined with brickbats. Because of intense heat they have turned brick red in colour. The inner dimension of this fireplace is 20 cm from north to south and 40 cm from east to west. It has survived to a depth of 7 cm.



Figure 5.33 Details of Structure 9G



Figure 5.34 Details of Structure 9H

The antechamber located to the southern end of Structure No. 9H measures 2.55 m from east to west and 1.50 m from north to south. The area enclosed is 1.95 m from east to west and 30 cm from north to south. The southern wall of Structure No. 9H forms the northern wall of this antechamber, whereas the east and west walls of Structure No. 9H extend further towards the south and form east and west wall of this antechamber. The southern wall of the antechamber is exposed to a length of 2.10 m and is 30 cm wide. It has survived to height of 17 cm. Within the antechamber is a small rectangular pit towards its eastern end. The area enclosed by the pit is 30 cm from east to west and 85 cm from north to south. This structure could be identified as kitchen-cum-storage.

Structure No. 9I

Only the southeast corner of this structure, located to the west of Structure No. 9J is excavated (Figure 5.36). Parts of its eastern and Southern walls have been exposed. The eastern wall has been excavated to length of 3.50 m whereas the southern wall has been excavated to a length of 1.20 m. The width of both the walls is 32 cm and they are made of a single row of vertically placed bricks.

Within the structure is a partition wall, which is 1.05 m to the north of the inner face of the southern wall. It is exposed to length of 55 cm and is 32 cm wide. It is made of two rows of horizontally placed bricks. Since a very small portion of this structure is excavated, its exact function is difficult to determine.

Structure No. 9J

This structure is located to east of Structure No. 9I (Figure 5.37). It is rectangular and very well-preserved. The wall of the structure has survived to a height of 40 cm, with 5-6 courses of bricks apparent. It is a narrow rectangular chamber covering an area of 3.35 m from north to south and 1.90 m from east to west. The northern wall of this structure is 2.60 m long and 32 cm wide. The eastern wall is 4.05 m long and 36 cm wide. The southern wall is 2.60 m long and 36 cm wide. The western wall 4.10 m long and 32 cm wide. The northern and western walls are made in bricks that measure 32 × 16 × 9 cm and all of the walls are made of a single row of vertically placed bricks.

The floor within the structure is flimsy and too narrow to be used for living purposes. This structure may therefore have been used as a storage area.

Structure No. 9K

To the outer face of the eastern wall of Structure No. 9J is attached a rectangular platform of bricks, 4.10 m long and 1.30 m wide. It has survived to a height of 12 cm (Figure 5.37). The north and south walls of Structure No. 9J extend further to form the north and south periphery of this platform. The eastern margin of the platform is delineated by a row of horizontally placed bricks. This platform could have been used for sitting.

Between Structure Nos. I and J is a narrow space of 65 cm that has been equally divided into two parts by a 32 cm thick wall. Each part is an L-shaped partition arranged in an opposite direction. The space between the two L-shaped structures could have been used for planting flowers.

To the south of Structure Nos. 9I, J and K is a narrow open space that could be a small street running between Structure Complex 9 and 10. The average width of the street is 1.60 m, and it has been exposed to a length of 7.20 m. It runs in the northeast to southwest direction.

Lane No. 1 and Bathing platform

In a subsequent period there appears to have been an encroachment on Lane No. 1, which must have happened when it fell into disuse. This encroachment comes from the extreme western excavated end of the lane, where a bathing platform was constructed (Figure 5.38). It is rectangular in shape, measuring 1.50 m from east to west and 1.43 m from north it south. It is made of wedge-shaped burnt bricks with an average



Figure 5.35 Fire pit inside the antechamber of Structure 9H



Figure 5.36 Details of Structure 9I



Figure 5.37 Details of Structures 9J in the background and 9K in the foreground



Figure 5.38 Details of a bathing platform in Lane 1, Locality 3

length of 26 cm. The broad end of each brick measures 14 cm and narrow end measures 10 cm. Each brick has a thickness of 7 cm. The wedge shaped bricks have been arranged in an alternating pattern. Five rows are apparent from east to west and nine are evident from north to south. The platform has a raised periphery (8 cm high) on all sides that made using rectangular bricks placed vertically on their sides. On the inner section of the north and south periphery, the gap between the periphery and the base of the bathroom is packed by placing bricks vertically on their sides. The main structure associated with this bathroom is most likely on the western side. In the middle of the bathroom surface are a few scattered burnt brickbats, which seem to be displaced from their original position.

Structure Complex 10

(Figures 5.39 - 5.46)

This complex is located between Lane Nos. 1 and 2 (Figure 5.39). In all, eight rooms from this complex have been excavated. It extends into the unexcavated eastern and western part of the locality. This structure is linear in shape, and the excavated rooms are found in a double row in the east to west direction.

Structure No. 10A

This structure is located on the extreme western end of the excavated area in the northwest and southwest quadrants of Trench 2XF4 (Figure 5.40). It is a narrow, rectangular chamber that measures 1.85 m from north to south and 80 cm from east to west. The eastern wall and parts of the other three walls have been excavated. The eastern wall is 3.30 m long and its average width is 60 cm. It has survived to a height of 17 cm. This wall is made of bricks that measure 36 × 18 × 9 cm. The southern wall has been excavated to a length of 2.20 m and is 60 cm wide. It has survived to a thickness of 21 cm. The western wall is exposed to a length of 1.60 m. Though its width cannot be measured, it has survived to a height of 14 cm. The northern wall, which has been excavated to a length of 95 cm, is 80 cm broad and has survived to a height of 11 cm. This narrow chamber could have been used for storage.

Structure No. 10B

To the east of Structure No. 10A is located structure Structure No. 10B, which has been destroyed on its southeast and southwest corners by two later pits (Figure 5.41). It falls in trench 2XF4. The pit on its southeast corner has a diameter 85 cm, whereas the one on its SW is very large, with a diameter of 1.80 m and an irregular shape. The eastern wall of Structure No. 10A forms the western wall of this structure. The southern wall has survived to length of 85 cm and is 60 cm wide. It is 12 cm high. The eastern wall is 4.05 m long with an average width of 50 cm and has survived to thickness of 18 cm. The northern wall is 3 cm long, 75 cm wide, and has survived to height of 14 cm. The area enclosed by this structure is 2.80 m from north to south and 1.90 m from east to west. It has a well-made floor, but since it is small in size it was probably used for storage.

Structure No. 10C

This structure is located to the east of Structure No. 10B in the northeast and southeast quadrants of Trench 2XF4 and the northwest and northeast quadrant of 2XF5 (Figure 5.42). It is well preserved and has been fully excavated. The eastern wall of Structure No. 10B forms the western wall of this structure. The northern wall is 4.70 m long, 50 cm wide, and has survived to a height of 18 cm. The eastern wall was identified primarily by its base, though in the northeast corner it has survived to a height of 11 cm. It is 4.05 m long and 90 cm wide.

The average size of the bricks used for this structure's construction is 32 × 16 × 8 cm. The southern wall is 4.75 m long and 60 cm wide with a



Figure 5.39 Structure Complex 10, Structural Phase I, Period IIA



Figure 5.40 Details of Structure 10A



Figure 5.41 Structure 10B



Figure 5.42 Structure 10C

surviving height of 15 cm. The area enclosed by this structure measures 2.90 m from north to south and 3.40 m from east to west. It has a hard, well-made floor and could have been used for living purpose. In the northeast corner is a small platform measuring 1 m from east to west and 60 cm from north to south. This could be a sitting platform.

Structure No. 10D

To the south of Structure No. 10A is structure Structure No. 10D, located in the southeast quadrant of Trench 2XF4 and the northwest quadrant of 2XG4 (Figure 5.43). This structure encloses an area of 80 cm from east to west and 1.40 m from north to south. Its entire eastern wall has been destroyed by a later pit. The southern wall of Structure No. 10A forms northern wall of this structure. The western wall is 2.60 m long with an average width of 60 cm and has survived to a thickness of 20 cm. Only a small portion of southern wall (1.10 m long) has survived. This portion is near the western end and has survived to a height of 20 cm, with an average width of 65 cm. This appears to have been a small storage chamber.

Structure No. 10E

To the west of Structure No. 10D is this structure, which is partially excavated towards its eastern side (Figure 5.44). It falls in Trench 2XG4. Its eastern wall is fully visible, whereas the northern and southern walls have only been partially excavated. A major portion of the structure lies in the unexcavated western section. The entire western wall of Structure No. 10D forms part of the eastern wall of this structure. The total length of this wall is 4.10 m, with an average width of 60 cm. The northern wall has been excavated to a length of 88 cm, but its width is not visible. The southern wall has been excavated for a length of 2.56 m. It is 64 cm wide and has survived to a height of 13 cm. Since a major portion of this structure is not excavated, its function is not apparent.

Structure No. 10F

This structure, which is a small narrow rectangular chamber probably used for storage, is located to south of Structure No. 10E (Figure 5.44). It falls in the southwest quadrant of Trench 2XG4. It encloses an area of 2 m from east to west and 80 cm from north to south. The southern wall of Structure No. 10E forms the northern wall of this structure. Because of disturbance, the eastern wall is partly damaged. It was exposed for a length of 1.80 m and was 32 cm wide. It survives to a height of 19 cm with two apparnt courses of bricks. It is made of a single row of bricks that was placed vertically. The western wall is 1.70 m long and its width cannot be measured, as has not been fully excavated. It has survived to a height of 14 cm. It had a brick paved floor, which can be seen on the western side. This feature could also have been used for storage.

Structure No. 10G

This is a narrow rectangular structure enclosing an area of 1.85 m from east to west and 3.35 m from north to south (Figure 5.45). It is located south of Structure No. 10B, spanning the southeast quadrant of Trench 2XF4, the eastern half of 2XG4, the western margin of 2XG5, and the southwest corner of 2XF5. The south wall of Structure No. 10B forms the north wall of this structure. The west wall, which is destroyed towards its north side for a length of 2.70 m, is 4.40 m long. It is intact towards its south side where its width is 60 cm. It has survived to a height of 12 cm. The south wall, which is parallel to Lane 2 in this area, is 3 m long, 50 cm wide and has survived to a height of 13 cm. The east wall is 4.50 m long and 55 cm wide. For a length of 1.90 m towards its northern side it has survived to a height of 13 cm. In the remaining portion towards the south only the base remains. This appears to be another storage structure as it is narrow and has a very flimsy floor.

Between Structure Nos. 10E and 10F on the west and Structure No. 10G to the east is a rectangular



Figure 5.43 Details of Structure 10D



Figure 5.44 Details of Structures 10E and 10F

mud-brick platform that has been badly damaged by later pits. It is 1.70 m broad and has survived for a length of 2.30 m towards its south side. This structure could have been an open space for carrying out a variety of activities.

Structure No. 10H

To the south of Structure No. 10C and east of Structure No. 10G is Structure No. 10H (Figure 5.46). It is located in the northeast, southeast, and southwest of Trench 2XF5 and spans the northern half of Trench 2XG5. It is roughly square and covers an area of 3.70 m from east to west and 3.60 m from north to south. The south wall of Structure No. 10C forms the north wall of this structure and the east wall of Structure No. 10G forms the its west wall. The south wall, which runs parallel to Lane 2, is 4.70 m long and 50 cm wide with a surviving height of 10 cm. The east wall, which is survived only by its base, is 4.70 m long and 50 cm wide.

Inside the structure is a well made plastered floor. Considering the structure's large size and high quality floors, it appears to have been used for dwelling.

Structure Nos. 10C and 10H most likely served as dwelling areas for the complex, whereas the remaining structures appear to have been used for storage. It is possible that its the kitchen lies towards the east, as traces of a fireplace are reported east of the eastern wall of Structure No. 10H.

Lane 2

To the south of Structure Nos. 10F, 10G and 10H runs this parallel lane, which spans the northeast, southeast, and southwest quadrant of Trench 2XG, the southeast quadrant of 2XG4, and the northwest and northeast quadrant of 2XH4 (Figure 5.47). This lane separates Structure Complex 10 and 12. It is 1.90 m broad and runs from the northeast to the southwest. It was exposed for a length of 10.25 m. The north walls of Structure Nos. 12E, 12D and 12A form the southern margin of the lane. It continues both towards east and west.

The lane has been disturbed by later cuts in two areas. The first cut comes from a circular pit that is 2.91 m from the exposed western end of the lane, along its northern margin. It is an Early Historic pit a diameter 1.46 m. The other disturbance comes in the form of an encroachment from later structure labelled – Structure No. 11.

Structure No. 11A

Structure No. 11A is a later encroachment on the western end of Lane 2. It spans the southern half of Trench 2XG4 and the northern half of Trench 2XH4. It is a rectangular room, longer in the east to west direction. This narrow rectangular chamber could have been a storage place for a complex that is located to its west in the unexcavated portion of the site. The western wall has not been excavated, while the north wall has been exposed to a length of 2.95 m and is 85 cm broad. It has survived to a height of 11 cm. The southern wall has been exposed to a length of 3.65 m, and has an average width of 55 cm with a height of 12 cm. The brick size used for construction is 32 × 16 × 8 cm. The south face of the wall is made of a line of single horizontally-placed bricks whereas the northern side is made of a line of vertically-placed bricks. The east wall is 2.20 m long, 45 cm broad and has survived to a height of 13 cm. In the northeast corner of the structure, which has a rough floor, are fallen burnt brickbats and large fragments of pottery.

STRUCTURE COMPLEX 12

(Figures 5.48 - 5.51)

Parallel to Lane 2 to the south is this structure complex, which lies in a linear pattern along the southern margin of the lane. Five rooms of this complex have been excavated. A major portion of the complex extends to the south and west.



Figure 5.45 Details of Structure 10G



Figure 5.46 Structure 10H



Figure 5.47 Structure Complex 12 to the north of Lane 2, Structural Phase I, Period IIA



Figure 5.48 Details of Structures 12A, 12B and 12C

Structure No. 12A

This room lies close to the exposed western end of Lane 2 (FIgure 5.48). It falls in the northeast, northwesy, and southwest quadrant of Trench 2XH4. It is roughly rectangular, covering an area of 3.20 m from east to west and 1.95 m from north to south. The northern wall of the structure is 4.05 m long, 50 cm wide and has survived to a height of 11 cm, while the eastern wall has been exposed to a length of 2 m and is 52 cm wide. It is survived by its base. The southeast portion of this structure underlies the unexcavated part of the site. The southern wall has been excavated to a length of 91 cm. It is 36 cm wide and has survived to a height of 11 cm. The western wall is 2.73 m long, 32 cm wide and has survived to a height of 11 cm. the brick size used for the construction of this structure is 32 × 16 × 8 cm. Within the structure is a flimsy floor with traces of burnt patches that perhaps indicate that a fire place is located unexcavated area of the structure. The structure has thus tentatively been identified as a kitchen.

Structure No. 12B

To the west of Structure No. 12A, a small portion of a square storage pit was exposed in the southwest quadrant of Trench 2XH4 (Figure 5.48). On the inside, it measures 1 m from north to south. It was excavated to a length of 90 cm from east to west. The western wall of Structure No. 12A forms its eastern wall. Its northern wall was exposed to length of 70 cm whereas its southern wall was exposed to a length of 65 cm. There appears to be a mud-brick platform on the northern side of the pit, which is 1.35 m broad. This small pit could be identified as storage for the complex.

Structure No. 12C

There is another structure to south of Structure No. 12A whose northn wall was exposed to length of 80 cm (Figure 5.48). It falls in the southwest quadrant of Trench 2XH4. This structure forms the west end of the south wall of Structure No. 12A. No other details are available as it was not excavated.

Structure No. 12D

This structure is located to the east of Structure No. 12A in the northern half of Trench 2XH5 and the northeast quadrant of Trench 2XH4 (Figure 5.49). The southern half of the structure has not been excavated. The east wall of Structure No. 12A forms its west wall, which has been excavated to a length of 2.10 m. The north wall is 3.04 m long, 32 cm wide, and is survived by its base for a depth of 10 cm. The east wall of the structure has been excavated to a length of 3 m. It is 45 cm wide and has survived to depth of 6 cm. The structure is 2 m wide from inside and has been excavated to length of 1.95 m from north to south. Along the west wall, 68 cm from the inner face of the north wall, is a large Early Historic circular pit with a diameter 1.60 m. This pit has damaged a considerable portion of the floor and the western wall. As this structure has a well-made floor is significant in size, it was probably one of the complex's dwelling areas.

Structure No. 12E

This structure is located to the extreme east of the excavated area of the locality, in the northern half of Trench 2XH5 and the southern half of Trench 2XG5 (Figure 5.50). It lies to the east of the Structure No. 12D. A major portion of its northwest side has been excavated. The eastern wall of Structure No. 12D forms the western wall of the structure. The northern wall has been excavated to a length of 3.90 m, and is 62 cm wide. It has survived to a height of 13 cm. Its other walls have not been excavated.

The structure has slightly well made floor, which was plastered. A square fireplace was found in the structure, 92 cm to the east of the inner face of its western wall and 2 m to the south of its northern wall (Figure 5.51). The fireplace is oriented from northwest to southeast. It has walls to the south, east and west. It is open on the N side. It measures 60 cm by 60



Figure 5.49 Details of Structure 12D



Figure 5.50 Details of Structure 12E



Figure 5.51 Details of a fire pit in Structure 12E



Figure 5.52 Mud brick platform in Index Trench 2XD1 and 2XD2

cm and has an 11 cm thick mud wall. The base of the fireplace is made of mud-bricks. Because of constant use, its sides and bottom have become brick-red in colour. This could been a kitchen for the complex.

Mud-brick Platform in Index trench (2XD1 - NE, NW quadrant; 2XD2 - NW quadrant)

(Figure 5.52)

At the base of Structure Complex 8 was a mud-brick platform in the index trench that spans the northern half of 2XD1 and the northwest quadrant of 2XD2. It was identifiable in the southern, western and northern sections of the trench. The platform is 80 cm high and 8 courses of mud-bricks were apparent. The average size of the bricks that were used is 28 × 14 × 7 cm. They were set in brownish yellowish mud mortar. This platform extends in all directions and, considering its thickness, appears to be large in size. It remains to be determined whether or not the entire eastern side of the Mature Harappan settlement was perched on an immense mud-brick platform, a tradition evident at a number of Mature Harappan sites.

Structural Remains in Trenches 2A17, 3Z17, 3X17

(Figures 5.53 - 5.57)

After the team's resistivity survey detected a hard surface, it was decided to investigate the feature by excavating Trenches 2A17, 3Z17, and 3X17. These trenches were excavated in a north to south line to uncover the features. The eastern half of Trench 2A17 was excavated, and 3Z17 and 3Y17 were fully exposed. In all, five layers were identified in the thre trenches (Figure 49), and they seem to correspond to Layers 4 through 9 of index trench 1C11. At the base of Layer 4, in the northern end of trench 3Z17, a mud-brick structure that extends into Trench 3Z17 was identified. It is a small double-room structure oriented 25° in the northwest to southeast direction (Figure 50). It belongs to the early Mature Harappan Period and is made of inferior quality mud-bricks. The average size of the mud-bricks used is 30 × 15 × 7.5 cm. These structures have been assigned Structure No. 14A and Structure No. 14B.

Structure No. 14A

The structure was found at depth of 1.90 m from the datum point (Figure 5.56 and 5.57). It is located to the south of Structure No. 14B, separated by a double partition wall. Half of it lies in Trench 3Z17 and the remaining half falls in Trench 3Y17. The structure is well preserved and exposed in all but the southeast corner. The western wall is 2.25 m in length with an average width of 28 cm, and has survived to a height of 24 cm with 3 courses of bricks apparent. The southern wall is 2.50 m long and 30 cm wide and has survived to maximum height of 30 cm. The eastern wall is 2.25 m long with an average width of 30 cm and has survived to a height of 25 cm. The northern wall, which is a partition wall, is 2.50 m in length and 15 cm in width. The total inner area is 1.85 m from north to south and 1.85 m from east to west. It has survived to a thickness of 15 cm. This wall is made of a single row of mud-bricks placed horizontally. Between Structure Nos. 14A and 14B there is a gap of 30 cm, which may have served as a drain.

Structure No. 14B

To the north of Structure No. 14A lays a small room belonging to the same structure (Figures 5.56 and 5.57). The structure encloses an area of 1.98 m from east to west and 1.80 m from north to south. Due to disturbance from a later pit, major portions of the northern and western walls have been destroyed. The western wall has survived to a lengtha of 70 cm and is 30 cm broad. It has survived to maximum

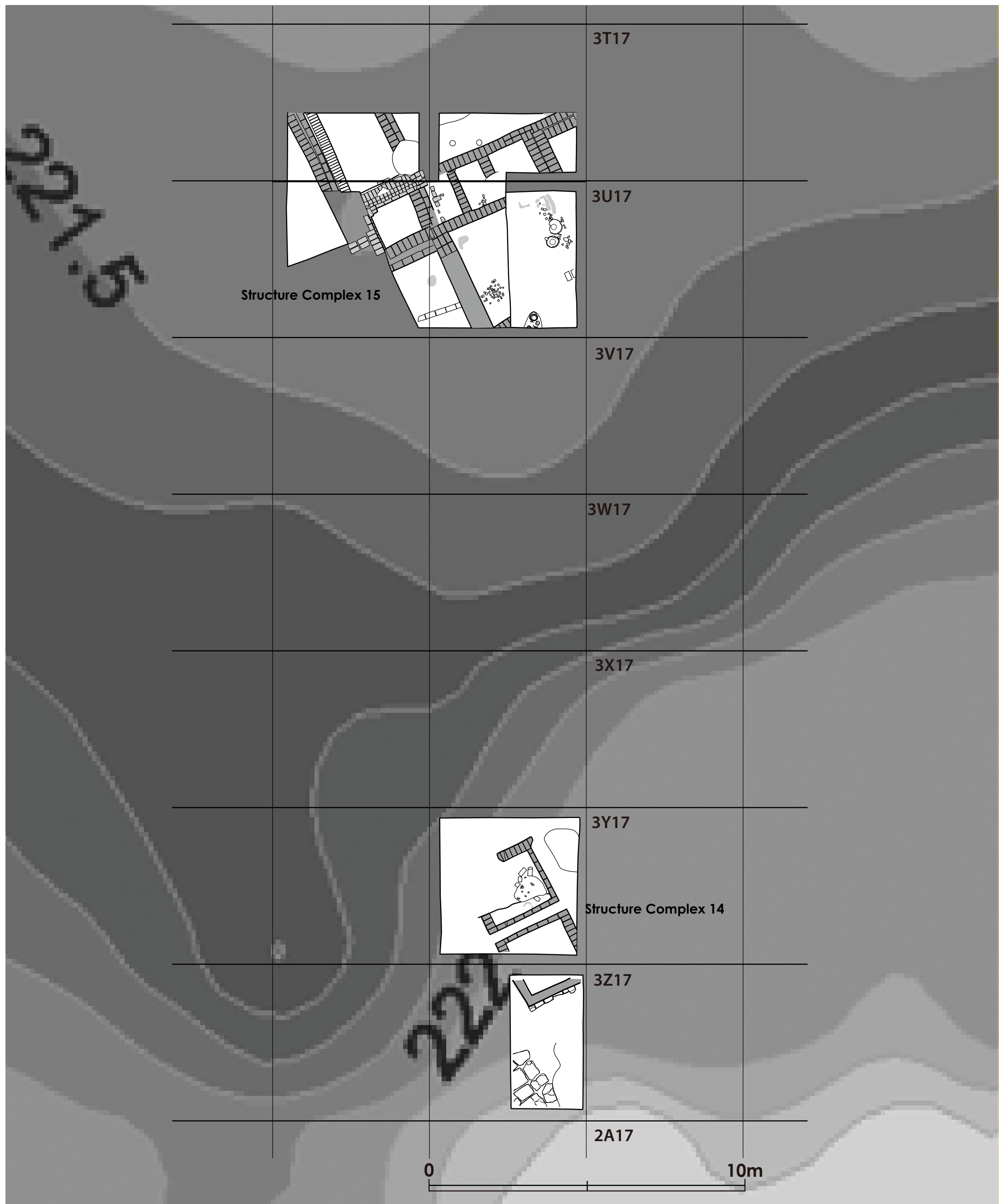


Figure 5.53 Structural remains in Northwest Area (1:200)

height of 28 cm. The southern wall, which served as a partition between Structure Nos. 14A and 14B, is 2.45 m in length with an average width of 15 cm. This wall was made of a single line of vertically-arrnaged bricks. It has survived to a height of 47 cm. The eastern wall is 2.25 m long, 15 cm broad, and made of a single vertical row of bricks, surviving to a height of 40 cm. The northern wall has survived to a length of 1.20 m and is 35 cm broad. It has survived to a height of 40 cm. The mud-bricks are set in yellow mud mortar.

Due to later disturbance the floors of this structure are badly damaged. Only a small portion of the floor has survived along the inner margin of the structure near its southern wall, suggesting that it was made of brick-bats and clay that has been rammed hard. As the contents have not survived it is difficult

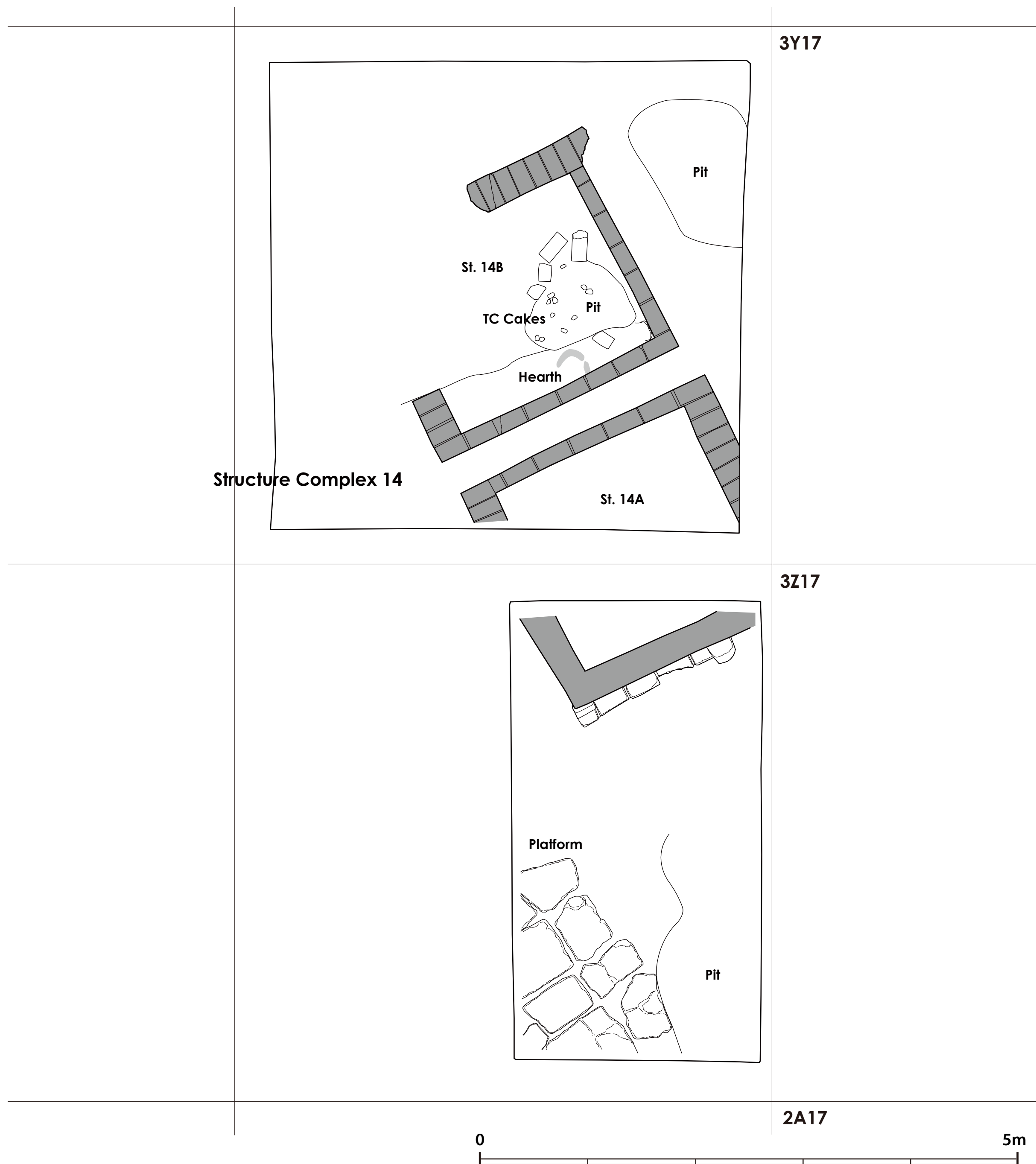


Figure 5.54 Structural remains in Trenches 3Y17 and 3Z17 (Northwest Area) (1:60)

to surmise the structure's function. In all probability, it was probably a domestic structure belonging to a poor family. The poor quality of the bricks used for construction and the poor workmanship clearly indicate poor economic status of its occupants.

Platform

To the south of the Structure No. 14A at distance of 1.20 m from the southwest corners of Structure No. 14A is a large platform, which was found in the base of Layer 5 at depth of 2.10 m (Figure 5.57). It lies in the southeast quadrant of Trench 3Z17 and continues into the northeast quadrant of Trench 2A17. This platform is made partly of clay and partly of clay lumps (Figure 51). It appears to be rectangular in shape, the eastern half of which has been excavated. Its western part lies in an unexcavated area. Due to later disturbances, the



Figure 5.55 Stratigraphy in Trenches 2A17, 3Z17 and 3X17



Figure 5.56 Details of Structures 14A in the foreground and 14B in the background in Trenches 2A17, 3Z17, 3X17, Period IIA



Figure 5.57 Mud and Mud-lump platform to the south of Structures 14A and 14B, Period IIA



Figure 5.58 Stratigraphy near the periphery of the site on the north, Trench 3T17

eastern periphery has been slightly damaged. It was excavated over area of 4.20 m from north to south and 1.50 m from east to west. It appears to be an open courtyard belonging to Structure Nos. 14A and 14B.

Excavation in Trenches 3U17, 3U18, 3T17 and 3T18

(Figures 5.58 - 5.67)

This area was selected for excavation to test the validity of the resistivity survey results that suggested the presence of a structure or feature in this area. Excavations exposed part of a large structural complex, made of mud-bricks and partly burnt bricks. In order to place this structural complex in proper stratigraphic context, part of southwest quadrant of Trench 3T17 was excavated to virgin soil. This small index trench has the following stratigraphy (Figure 5.59):

Layer 1

This layer is hardly 7 cm thick, is badly disturbed, and was formed by eroded material from the site. It is loose, gray in colour and contains mixed material.

Layer 2

This layer is intact, slightly uneven on top, yellowish in colour and composed of habitation and brick wall material. The brick wall material is hard whereas habitation material is loose. It is almost homogeneous and contains little cultural material. Its average thickness is 25 cm.

Layer 3

This layer is gray in colour but has a yellowish line of fine sand in the middle. It is very loose and heterogeneous in nature. It is almost horizontal both at the top and at the bottom and has average thickness of 18 cm.

Layer 4

This layer, which is slightly uneven on the top, is yellow in colour, hard in composition, homogeneous in nature, and is composed of uniform mud-brick wall material. Towards its northern end it has been destroyed by a later pit from layer 3. It is devoid of cultural material.

Layer 5

This layer is uneven on top but is even at its bottom. It is the first occupational layer at the site, which is gray-white in colour, hard and homogeneous in nature, and devoid of cultural material. Its average thickness is 20 cm.

Layer 3, 4, and 5 belong to the Early Harappan Period at site whereas Layer 2 belongs to the Early Mature Harappan phase.

Layer 6

This layer is composed of natural soil consisting of a fine sand deposit and containing a lot of kankars.

Structure Complex in Trenches 3U17, 3U18, 3T17, 3T18

(Figure 5.60 - 5.66)

This entire complex is oriented in 25° in the northwest to southeast direction. Initially, the team decided to excavate two trenches, namely 3T18 and 3U18 in Locality 3. 3U18 was fully excavated whereas only the southern half of 3T18 was exposed. However after detecting a well-made mud-brick and burnt brick structure that extended towards the east, two more trenches, namely 3T17, 3U17, were opened. 3U17 was completely excavated whereas only the southern half of 3T17 was exposed. At a depth of 5 cm from the surface, the remains of structures were identified. These were first traced on plan and later excavated to their base level.

A large structural complex numbered 15 has

3T17 West Wall Cross-section

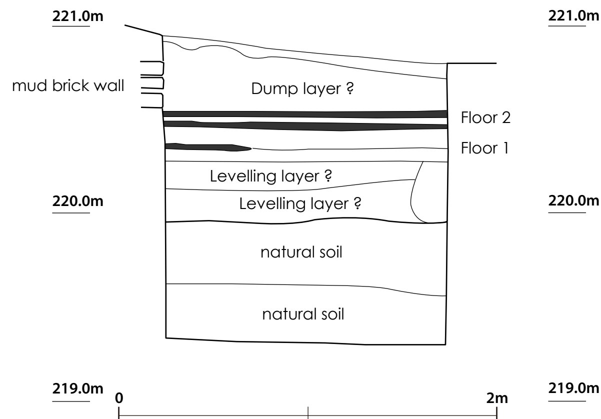


Figure 5.59 Cross-section in Trench 3T17 facing west (1:40)

Pit
St. 15D
Pit
Pit
St. 15C
Pit
St. 15F
TC Cakes
St. 15E
Hearth
Unexcavated
St. 15B
TC Cakes
Jar
Hearth
Jar
TC Cakes
St. 15F
TC Cakes
Hearth
St. 15A
Historical pit
0
5m

Figure 5.60 Structural remains in Trenches 3T17, 3U17, 3T18 and 3U18 (Northwest Area) (1:60)



Figure 5.61 Structure Complex 15 near the periphery of the site, Structural Phase I, Period IIA



Figure 5.62 Details of Structure 15A

been partially excavated, though it extends into unexcavated areas in all directions. Due to the road on its northern and western sides and a standing crop of mustard on its eastern side the complete complex could not be exposed. However, seven rooms assigned Structure Nos. 15A through 15G were either partially or fully excavated.

Structure No. 15A

This was the first structure to be exposed. It was found at a depth of 8 cm from the surface (Figure 5.62). It is a small rectangular structure divided into two parts by a small partition wall made of mud-bricks. Parts of eastern and northern wall have been exposed, though its western and southern walls have not been excavated. Therefore, its exact dimensions are not clear. This structure is located in the eastern half of Trench 3U18 and along the western edge of Trench 3U17. Its eastern wall has been exposed over a length of 2.70 m. Its height is 25 cm and its average width is 65 cm. The northern wall was excavated to a length of 2.10 m with an average width of 65 cm. It has survived to a height of 25 cm. The excavated area of the structure's interio measures 2.50 from north to south and 1.50 m from east to west. In the case of the northern wall the outer course of bricks was placed vertically. In case of the eastern wall, the outer course was placed horizontally. The average brick size is 40 × 20 × 10 cm. Within the structure, at a distance of 1.70 m to the south of the north wall, is a partition wall that runs from east to west. It is made of a single row of bricks that were placed horizontally. The bricks measure 30 × 15 × 7.5 cm. The wall that is visible in the excavated area is 1.80 m long and only one course of the wall has survived. In the northern half of structure was probably a small fire pit. It is 65 cm to the south of the north wall and 50 cm to west of the east wall. It is a small rectangular fire pit – 35 cm from east to west and 30 cm from north to south. It was found on the floor level of the structure. The floor is made of clay, which was well rammed and plastered. A number of broken potsherds of coarse varieties, particularly the kind used for cooking purposes, were found on the other side (i.e. the southern part of the structure) of the partition wall.

Structure No. 15B

This structure is located north of Structure 15A. It falls in the northwest quadrant of Trench 3U17 and the northeast quadrant of Trench 3U18 (Figure 5.63). It is a very small. Square structure that encloses an area running 1.30 m from north to south and 1.40 m from east to west. This was the original size of the structure. However, in a later phase, the eastern wall was shifted to the east by 70 cm. In the later phase, the east to west length of the structure became 2.10 m.

All four walls of the structure have been excavated. The north wall of Structure No. 15A forms the south wall of this structure. It is entirely made of mud brick. The western wall is partially made of burnt bricks. The lower two courses and the upper two courses that have survived are made of burnt bricks whereas the middle courses are made of mud-bricks. The western wall is 2.80 m long, 32 cm wide and has survived to a height of 75 cm. The average size of its burnt bricks is 8 × 16 × 32 cm. The lower 20 cm and upper 18 cm are made of burnt bricks whereas a 35 cm thick portion in between is made of mud-bricks. The bricks are arranged in a typical header and stretcher pattern. The northern wall of the structure, which is 2.55 m in length, was made in such a way that it has a step like projections at every lower course of bricks on its inner side. The total surviving height of the wall is 40 cm and its width on top is 28 cm. In all, four courses have survived. The second course projects 13 cm outwards towards south from the first line of bricks, the third course projects 10 cm, and the fourth projects 9 cm from the wall. It is hard to understand why the wall was built in this fashion. It is likely that entry to this room was from north side. Hence these step like projections were made near the entrance. The original eastern wall is 1.90 m in length and 60 cm in



Figure 5.63 Details of Structure 15B



Figure 5.64 Details of Structure 15E and 15G

width with a surviving height of 5 cm. However the wall of the second phase, which is 15 cm to the east of the first wall, has survived to height of 30 cm and was built of mud and burnt bricks. This small room may have been used for storage, as no other function can be visualized.

Structure No. 15C

To the north of Structure No. 15B is Structure No. 15C. It spans the southern half of Trench 3T18. The southern wall of this structure has been fully excavated whereas the eastern and western walls are only partially exposed. The northern portion of wall falls within the unexcavated area, as such the exact dimensions of the structure are not clear. The total interior area of the structure excavated so far measures 2.75 m from north to south and 1.70 from east to west. The northern wall of Structure No. 15B forms the its southern wall. The southeast corner of the structure has been destroyed by a later circular pit with a diameter of 1.20 m. The portion of the eastern wall that has survived and was exposed measures 1.26 m in length. It is 50 cm wide and has survived to a depth of 16 cm. The western wall was exposed to length of 3.50 m. It originally had a width of 50 cm. Subsequently the wall was broadened by 40 cm, increasing the total width to 90 cm. The wall has survived to maximum height of 60 cm towards its southern end. It has a rough floor made of clay that was rammed hard and plastered.

Structure No. 15D

A very small portion of this structure has been excavated in the southern half of 3T17 and the southeast quadrant of 3T18. It is located to the east of Structure No. 15C and north of Structure No. 15E. The southern wall of the structure has been fully excavated, whereas only a very small portion of the eastern and western walls has been exposed. A major portion of structure, including its northern periphery, lies in the unexcavated area. The eastern wall of Structure No. 15C forms the western wall of this structure. The southern wall is 4.80 m long and 34 cm wide. It has survived to maximum height of 17 cm. The eastern wall is 50 cm wide and has been excavated to a length of 14 cm. Only the basal course of its bricks has survived. It has a very well made floor of mud, which was rammed and plastered. Considering the size of this room and its well-made floor, the occupants of the structure complex probably used it as a dwelling space.

Structure No. 15E

Located between Structure Nos. 15D and 15F is Structure No. 15E, which falls in the southern half of Trench 3T17 and the northwest quadrant of Trench 3U17 (Figure 5.64). It is a narrow chamber-like room, which has been almost completely excavated except for its southeast corner. The southern wall of Structure No. 15D forms its northern wall. The later eastern wall of Structure No. 5B forms its western wall. Its southern wall is 4.50 m in length 34 cm in width and has survived to a height of 25 cm. Along its western wall is a mud-brick platform that is 55 cm in width and has the same length as the western wall. It has survived to height of 5 cm. The area inside the structure, excluding the platform, measures 2.40 m from east to west and 1.45 m from north to south. It has a smooth floor made of clay. This narrow chamber-like room with a platform inside may have been used for craft activities. As the floor of level 13 is close to the existing surface, any trace of craft activities may have been washed away.

Structure No. 15F

This structure is to the east of Structure No. 15A and south of Structure No. 15E. It is located in Trench 3U17. The eastern wall of Structure No. 15A forms the western wall of this structure (Figure 5.62). The southern wall of Structure No. 15E forms its northern wall. The southern wall was exposed to a length of 60 cm in southwest corner of structure. As half of



Figure 5.65 Details of Structure 15E and 15G



Figure 5.66 Details of Structure 15F



Figure 5.67 Details of a fire pit and jars in Trench 3U17

the structure is not been excavated, its exact function cannot be determined. It has a rough and disturbed floor.

Structure No. 15G

Structure No. 15G is located to east of Structure No. 15E. It falls in the northeast quadrant of Trench 3T17 (Figure 5.64). It encloses an area of which 1.30 m from north to south and 95 cm from east to west has been excavated. Parts of northern and western walls have been excavated. Both walls are thick and well made. The north wall is 70 cm thick and has survived to a height of 5 cm. The western wall is also 70 cm thick and has survived to a height of 5 cm. Inside the structure is a well-made floor. Considering the size of the walls it appears to have been a large structure, though its main portion was not excavated.

Fireplace in the northeast quadrant of Trench 3U17

On the eastern side of Structure No. 15F was a rectangular fireplace with two pots by its side (Figures 5.66 and 5.67). The fireplace is located 80 cm to the west of the eastern section and 50 cm to the south of northern section of trench 3U17. It is a rectangular fireplace measuring 80 cm from north to south and 50 cm from east to west. It has a mud-brick lining, a major portion of which has been destroyed as it is close to the surface. The fireplace is oriented 10° in the northwest to southeast direction. It has survived to depth of 10 cm. Because of its constant and lengthy use, the sides and the bottom have become burnt red.

Immediately to its south are two middle-sized pots of a red variety. They are arranged in the north to south direction. Only the lower half of the pots has survived. Both are globular with a flat, narrow base. The one close to the fireplace is larger in size, with a diameter of 50 cm. The other pot, which is 6 cm to the south, has a diameter of 38 cm.

3 STRUCTURAL REMAINS OF PERIOD-IIB

The following section consists of descriptions of the exposed structures from Period-IIB (Figures 5.68 - 5.137).

Structure Complex No. 2

(Trench Nos. 1, 1A, 1A1 and 1B, sealed by layer 2) (Figures 5.69 - 5.71)

This structure complex is a large, multi-roomed mud-brick building that is rectangular in plan. It is oriented 30° from northwest to southeast. It lines up with Structure No. 1, which is associated with an early construction phase. The main structure is divided in two by a partition wall. On the northeastern side of the main structure there is a broad rectangular platform. At some point after the complex's construction its walls were thickened by adding more brick courses on the outer side. Additionally, the western wall was extended to form another complex. As will become clear in the following discussion, Structure No. 2 provides clear evidence for two distinct construction phases..

Early construction phase

The original structure extends over an area of 6.20 m by 4.20 m. All four walls of the structure are intact and were exposed during the excavation. A partition wall divides the main structure in half. This wall is located 3.07 m from the inner edge of the northern wall and 1.20 m north of the southern wall. The chamber located on the northern side of the wall has been named 2A and the one on the southern side is 2B. The partition wall is 2.65 m from east to west and 50 cm in breadth. Two brick courses set in yellow clay mortar of the wall have been preserved. The wall survives to a height of 25 cm.



Figure 5.68 General plan of the structural remains in Central Area (1:500)

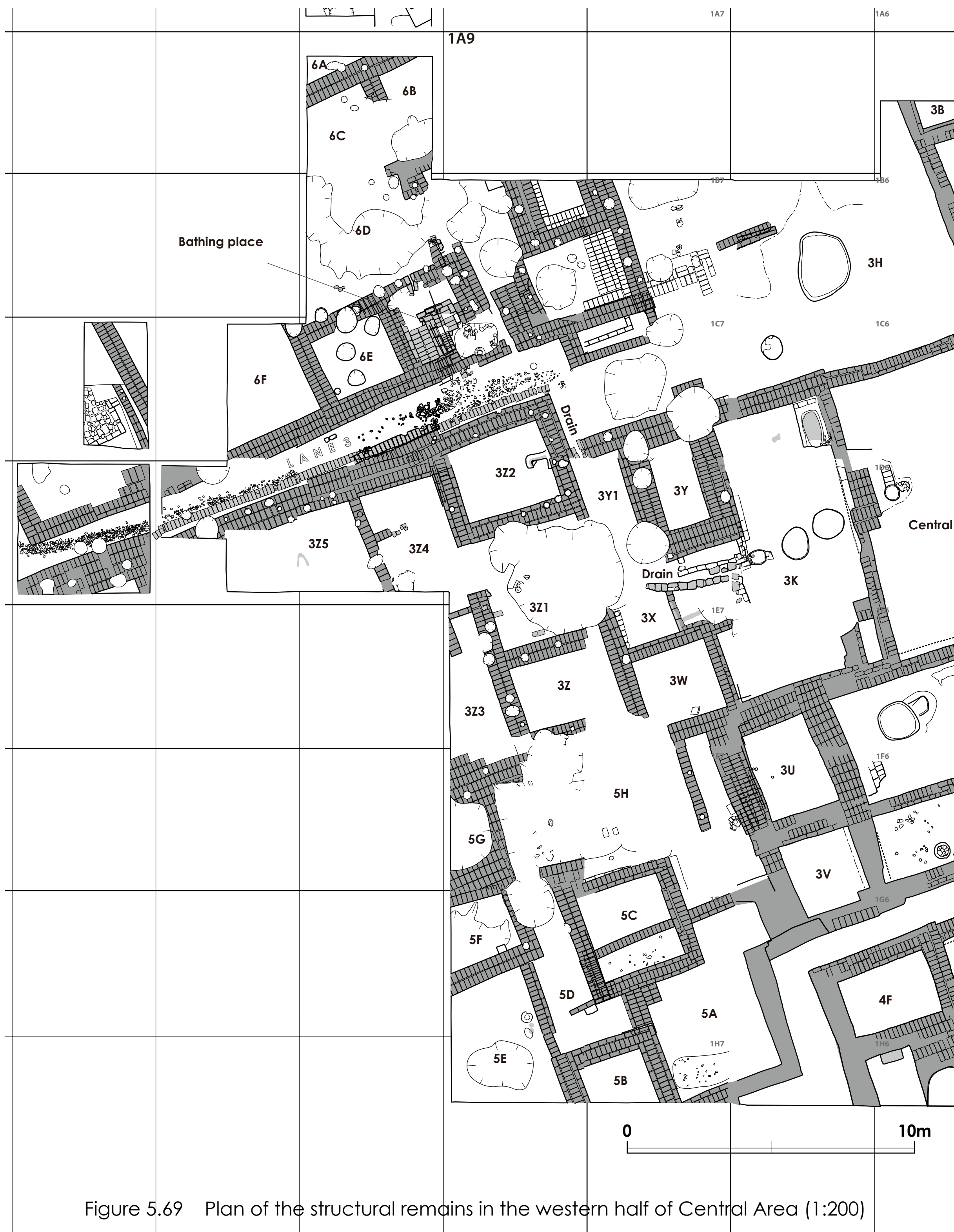


Figure 5.69 Plan of the structural remains in the western half of Central Area (1:200)

Structure No. 2A

The northern part of the structure termed 2A is roughly square in plan and measures 3.05 m from north to south and 2.80 m from east to west, from the inner edge of the walls. This large room may have been used for dwelling (Figure 5.71).

Structure No. 2B

To the south of the partition wall's inner edge is a small chamber-like room measuring 2.80 m from east to west and 1.20 m from north to south (Figure 5.71). This component of the structure appears to be have been a bath-room, as the eastern part of this



Figure 5.70 Plan of the structural remains in the eastern half of Central Area (1:200)

chamber is lined with wedge-shaped burnt bricks (these cover an area of 1.10 m from east to west by 1.20 m from north to south) On the margin of the burnt bricks runs one vertical course of bricks along the inner edge of the partition wall on its northern side, which is plastered with coating of fine yellow clay 7 cm thick. Thus, this part of the room appears to have been waterproofed. In the remaining portion of this room was given over to a floor of mud-bricks, which covers an area of 1.48 m from east to west by 0.96 m from north to south. There appears to be a small mud platform by the side of the bathroom that was also plastered with a coating of yellow clay. Along the edge of the partition wall at a distance of 45 cm from the

inner face of the western wall was made a small bench-like feature consisting of a single vertical course of mud brick. It runs parallel to the wall for a length of 1.05 m and 27 cm in breadth.

Later phase of Structure No. 2A

(Trench Nos. 1 and 1A)

A lot of new additions were made in the later phase of Structure No. 2A. Three horizontal mud-brick courses were added to the outer edge of the western wall, thickening it. The additional courses added 55 cm to the breadth of the wall. This addition does not end at the southwestern corner of the original structure (early phase), but continues towards the south. It was exposed to a total length of 13.20 m. No uniform construction technique was used to assemble the wall, as there are horizontal and vertical bricks in the same course. A similar extension was added to the northern wall. All of the wall extensions survived to their full width of 55 cm. The total width of the wall is now 1.30 m.

Platform No. 2

A thick mud platform was added parallel to the outer side of the eastern wall of Structure No. 2 (Figures 5.71 and 5.72). It is 5.32 m long and 2.55 m in its maximum width. Four courses of the platform's bricks of the platform are apparent in the eastern section. The platform was made by neatly arrange bricks vertically along its outer edges. Inside, some lines of brick are arranged vertically and some horizontally. Two large postholes were found in the platform.

Structure No. 2C

The structure labeled 2C is a room that was added to the original structure at a later stage. The floor of this room is well rammed and plastered, and is located 40 cm from the top of the surviving platform.

Platform No. 1

A roughly square platform was added to the southern side of Structure No. 2 (Figure 5.72). This platform is oriented in the same direction as Structure No. 2. The bricks that line its periphery are vertically arranged. The size of the bricks is similar to those that were used in the construction of Structure No. 2. Interestingly, the platform is separated from the structure by a 60 cm gap. Still, the platform must have been built simultaneously with Structure No. 2, as the original western wall continues to form the western edge of the platform. The platform measures 5.55 m from east to west and 4.22 m from north to south. The platform was later cut by a pit that measures 1.78 m from north to south and 2.65 m from east to west. The exact function of the platform cannot be easily identified, as its contents have been lost due to plowing. However considering modern parallels, it is likely that the platform was used for a wide range of activities.

Platform No. 3 (Trench No. 1E)

43 cm to the south of Platform no.1 is yet another platform almost symmetrical to Platform No. 1 and Structure No. 2 (Figure 5.72). The platform was found in the northwestern quadrant of Trench No. 1E. Only a small portion measuring 1.45 m from north to south and 1.50 m from east to west has been excavated. The platform was partially destroyed by a later pit. The pit, oval in shape and oriented roughly from northwest to southeast, measures 1.25 m by 90 cm. It is 35 cm deep. Its sides and the bottom are irregular and could have been used later as a garbage pit. These platforms, conveniently located between Structure Nos. 2A, 2B and 2D, could have been part of an open space used to perform domestic activities.

Structure No. 2D

Immediately to the south of Platform No. 3 is a roughly square room that nearly completely excavated (Figure 5.73). Only a portion of the southeastern



Figure 5.71 St. nos. 2A and 2B and Platform no. 2, from southwest



Figure 5.72 Platform nos.1 and 3, from southwest



Figure 5.73 General view of Structure Complex no.2, from south

corner was left unexposed due to a lack of digging space. The room measures 4.35 m from north to south and 4.35 m from east to west. The northwest corner has been destroyed by a later pit. The eastern wall of the structure was no exposed. The southern wall of the structure has been excavated to a length of 3.30 m. A portion of this wall toward the southeastern corner could not be excavated. The average width of this wall is 62 cm and only the a 10 cm portion of its basal course has survived. The western wall is 4.35 m in length but its width is smaller (30 cm) than that of the southern wall. The wall has survived to a maximum height of 20 cm. The northern wall of the structure that is also 4.35 m in length merges with the brick flooring of the room and its width was not apparent. This part of the structure complex could have been used for dwelling purposes as it has well-made floor of mud bricks. The entire structure is located in Trench 1D.

Structure No. 2E

To the south of Structure No. 2D is a small rectangular chamber-like feature spanning the SE quadrant of Trench 1D and NE quadrant of Trench 1E. This feature sandwiched between Structure Nos. 2D and 2F. The southern wall of Structure No. 2D forms the northern wall of this feature and the northern wall of Structure No. 2F forms its southern wall. The western wall of Structure No. 2F continues towards the north and forms the western wall of this feature. The eastern portion of this feature was not exposed. It is 1 m (from inner margin) in width and was excavated to a maximum length of 2.35 m. This small chamber was likely used for storage purposes (Figure 5.73).

Structure No. 2F

This is the southernmost room of the complex (Figure 5.73). The present owner has cut the structure and features to the south of the room in the process

of flattening the land for agriculture. A very small portion of this room has been excavated. Only the southwestern corner of the southern wall has survived to a length of 40 cm with an average width of 50 cm. Only 10 cm of the wall's thickness has survived. This structure has a well-made floor of brick and brickbats and may have been another dwelling room. Along the external face of the western wall is a small brick platform, measuring 1.70 m from north to south and 1.10 m from east to west. Although it encroaches on the Main Street, it may have been contemporary to the structure complex and used for sitting. The western wall of this complex is common to all the rooms. Based on the contents of the excavated rooms, the team believes that all of the exposed rooms of Structure Complex No. 2 were used either for dwelling or storage. The kitchen of this complex probably lies somewhere in the southern end eastern side that has not been exposed.

Main Street

Immediately to the west of the Structure Complex No. 2 is an wide open space running parallel to its western wall. This space has been identified as a main street for the town during the Mature Harappan period. Along the western edge of the street is another complex (Structure Complex No. 3). The street runs 30° from northwest to southeast and has been exposed to a length of 28 m. It continues further north. The southern end stops at the northern wall of Structure No. 4G. Here lies a junction in the street and the lane. The width of the street varies from 3.60 m near the northern end to 4 m in the middle (Figure 5.74).

Main Street is wide enough to be used for plying bullock carts, and indeed traces of bullock cartwheels mark its surface (Figure 5.75). The width of the bullock cartwheel marks varies from 8 cm to 20 cm. Similar bullock cartwheel marks have been reported from the streets of Harappa. In the middle of the street at a distance of 8.90 m to the south of the northern end of the street is a small mud-brick wall that encroaches on the street. This wall, 1 m long from north to south and 55 cm wide from east to west, appears to be a later feature, added to the outer surface of the eastern wall of Structure No. 3I. This may have been done to strengthen or repair the wall. A small passage between Structure Nos. 3I and 3L, added to Structure Complex No. 3 after its original construction, measures 2 m in length from north to south. This passage lines up with the above-mentioned encroaching wall, indicating that it too is a later addition.

It is quite likely that the street turns to east at right angle, although this hypothesis needs to be confirmed. The street deposit consists mainly of pottery and bones that may have been thrown after its use was discontinued. Due to the constant plying of bullock carts, the street has developed concave surface and depression-like features. Only traces of the streets original surface survive, but the areas that are preserved indicate that it was well rammed and hard in nature when it was in use. The street runs through the following trenches: 1E (NW, SW), 1E1 (NE, NW and SE), 1D1 (NE, NW, SE and SW), 1C2 (NE, SE), 1C1(NW, SW and SE), 1B1 (NW, SW), 1B2 (NE, NW and SE) and 1A2 (SE, SW).

Structure Complex No. 3

(Figure 5.77 - 5.97)

A large complex consisting of numerous different sized rooms was exposed on the western side of Main Street (Figures 5.73 and 5.74). This complex is located between Main Street and Lane No. 1, which runs along the southern margin of the complex. The entire complex is made of mud-bricks bearing the Harappan ratio of 1:2:4. It is contemporary with Structure Complex No. 2, which ia located on its eastern side on the other side of Main Street. Three different sized bricks were used for the construction of this complex:, these include 30 × 15 × 7.5 cm, 40 × 20 × 10



Figure 5.74 Main Street between Structure Complex nos. 2 and 3, from southeast



Figure 5.75 Bullock-cart wheel marks on the surface of Main Street



Figure 5.76 General view of Structure Complex nos. 2-4, from southeast



Figure 5.77 General view of Structure Complex no. 3, from southeast

cm and 34 × 17 × 8.5 cm bricks. The first size was the most commonly used whereas the latter two were used only occasionally. 22 rooms from this complex have been excavated and it appears that the original size of the structural complex was actually much bigger as it extends in the northern and western directions, which have not yet been exposed. The entire complex was given the overarching label Structure Complex No. 3, whereas each room has been given alphabetical suffix starting with A. All the rooms in this complex were oriented 30° in the northeast-southwest direction. The team also noticed that the entire complex was built around a large rectangular courtyard, which has been labeled as Structure No. 3J.

Structure No. 3J

This large rectangular structure is located west of Structure No. 3G and almost in the centre of Structure Complex No. 3. It covers an area of 9.60 m from north to south and 7.50 m from east to west. The entire structure is well preserved and has been fully excavated. The western wall of Structure No. 3G forms the eastern wall of the structure, which is 11 m long and 50 cm broad. Part of the southern wall of Structure No. 3H forms the northern wall of this structure. It is 7.40 m from east to west and 45 cm broad. The southern wall of the structure, 9.10 m in length and 50 cm wide, forms the northern wall of Structure No. 3R and part of the northern wall of Structure No. 3T. The western wall is 10.80 m long from north to south and 50 cm wide. It broadens to the width of 95 cm in the middle for a length of 2.90 m. This wall is located 2.20 m from the northwestern corner (inner surface). The platform-like feature in the wall may have been the entrance to Structure No. 3K, located to the west (Figure 5.78).

No contemporary features have been identified inside the enclosed area of the structure. In front of the platform-like entrance in the western wall at a distance of 30 cm to the east excavators found a circular underground clay bin with a diameter of 55 cm and the remains of a storage jar immediately to its east. To the northern edge of the clay bin is attached a single course brick wall which survived to a length of 90 cm and a thickness of 15 cm. This wall is 30 cm broad. Excavators also found a clay bin, storage jar, and small wall running in the north-south direction, but these postdate the structure (Figure 5.79). The structure has a smooth floor. Considering the fact that it is devoid of any features, and large in size with a central location, as the authors' believe that this structure is the central open courtyard of the complex. It should be mentioned that typical Harappan house plans consist of a central open courtyard, surrounded by rooms. The plans of Structure Complex No. 3 follow this plan. The following are descriptions of the rooms located around the central open courtyard.

Structure No. 3A

This structure is located on the northern side of the Structure Complex No. 3 (Figure 5.80). It is rectangular in plan and three of its walls have been excavated. The southern and western walls were fully exposed, whereas the eastern and northern walss were only partially excavated. The southern wall of the structure measures 10.90 m in length from north to south and its average width is 70 cm. This wall has survived to a maximum height of 12 cm. The western wall is 4.70 m long from north to south and 55 cm wide. It was found intact to a height of 10 cm. The eastern wall has been exposed near the northeastern corner of the structure for a length of 16 cm. The northern wall of this structure, which is located near its northwestern corner, has survived to a length of 2.10 m from east to west and a height of 10 cm.

Inside the structure is a cylindrical pit (silo) located near its northwestern corner. It was found 56 cm east of the western wall and 40 cm south of the northern wall. This perfectly cylindrical pit, with a diameter of 1.05 m, may have been a storage pit (silo). This pit has not been excavated to its base and therefore its total depth is not yet known. The uneven



Figure 5.78 Central open courtyard (St. no. 3J), from northwest



Figure 5.79 Later features in the central courtyard (St. no. 3J), from southeast

floor and lack of any kind of cooking facility indicates that this structure served as storage for the complex.

Structure No. 3B

In the southern half of Trench 1A5 to the northwest of Structure No. 3A is Structure No. 3B, which has been partially excavated (Figure 5.80). Only an area of 3.10 m from east to west and 1.20 m from north to south has been excavated, exposing its southwestern corner. The southern wall of the structure, which stands over a mud-brick foundation, was exposed for a length of 3.50 m from east to west. Part of the northern wall of Structure No. 3A and 3C form the southern wall of this room. The average width of this wall is 50 cm. Two courses of this wall have survived, leaving a height of 20 cm above its foundation intact. This foundation is slightly broader (65 cm) than the wall above. The western wall of the structure was excavated to a length of 1.85 m from north to south. This wall is slightly broader (55 cm) in comparison with the southern wall. This has also survived to a height of 20 cm. Since a very small portion of this structure has been excavated, it is impossible to determine its exact function.

Structure No. 3C

This structure is located to the south of Structure No. 3B (Figure 5.80). Its longer axis lies roughly in the north-south direction. The interior of this rectangular structure measures 3.30 m from north to south and 2.17 m wide from east to west. The southern wall of Structure No. 3B forms its northern wall, whereas the western wall of St. no. 3A forms its eastern wall. The western wall measures 4.50 m long from north to south and its average width is 65 cm. Only the basal course of this wall is intact, preserved to a height of 6 cm. The southern wall is 3.50 m from east to west and its average width is 55 cm. It has survived to a height of 20 cm. Inside the structure is a relatively well-made floor of mud-brickbats. The floor has been damaged in the middle by a later circular pit, located 30 cm to the east of the western wall and 1.10 m to the south of the northern wall. As no other features were encountered on the floor of this structure, it was identified as one of the dwelling rooms of the complex.

Structure No. 3D

This is a small rectangular antechamber to Structure No. 3E oriented in the northwest-southeast direction and located along the street (Figure 5.81). It is separated from Structure No. 3E by a massive mud-brick wall that is 75 cm wide. The inner portion of the antechamber measures 2.55 m from north to south and 1 m from east to west. All the walls are made of bricks arranged vertically in mud mortar. The southern wall is 80 cm long and 15 cm wide. The western wall is 1.35 m long and 15 cm wide. Both have survived to a height of 12 cm. Inside the structure is a small rectangular box made of a single course of bricks arranged vertically. It is 27 cm east of the western wall and 1.05 m north of the southern wall. It is in the northeastern corner of the antechamber. The box encloses and area that measures 70 cm from east to west and 1.40 m from north to south. The eastern wall of Structure No. 3I continues towards the north and forms the eastern wall of this chamber. Its average width is 60 cm. The western wall of this structure is well-preserved; it measures 2.50 m from north to south. It has survived to a height of 12 cm. This antechamber does not have proper floor and the only its only possible function must have been the storage of grains or pulses.

Stucture No. 3E

Structure No. 3E is square on plan and located west of Structure No. 3D (Figure 5.81). The inner walls of the structure measure 2.25 m from north to south and 2.80 m from east to west. All four walls of the structure have been excavated. The eastern wall is 3.80 m in length and 75 cm in width. It has survived to a height of 13 cm and it appears that only its last course of brick has survived. The southern wall, with an



Figure 5.80 St. nos. 3A and 3C, from nor-theast



Figure 5.81 St. nos. 3D and 3E, from northwest

average thickness of 70 cm, is 4.35 m in length from east to west and is intact to a maximum thickness of 17 cm. The western wall is 3.65 m long from north to south, 70 cm broad and has survived to a height of 15 cm. The northern wall is 4.30 m long from east to west and 65 cm wide, surviving to a maximum height of 12 cm. The floor of the structure is uneven and devoid of any features. This structure, along with its antechamber (Structure No. 3D) was probably one of the complex's storage facilities.

Structure No. 3F

This structure located to the west of Structure No. 3E is oriented in the northeast-southwest direction. Along the inner edges of its walls the structure measures 3.15 m from east to west and 1.85 m from north to south. All four of its walls have been excavated. The southern wall of Structure No. 3A forms the northern wall of this structure and the western wall of Structure No. 3E forms its eastern. The southern wall is 4.30 m from north to south and 68 cm wide. All along the length of the inner side of the southern wall is a rectangular platform, 40 cm wide. The western wall of this structure, 3 m long from north to south, is made of a single course of bricks arranged vertically. This wall is made of mud-brick measuring 40 × 20 × 10 cm. Inside the structure is a perfectly cylindrical pit (Figure 5.82). It is located 1.05 m east of the western wall and 10 cm south of the northern wall. The diameter of this pit is 1.70 m. It was probably a storage pit, considering its perfectly cylindrical shape. After its abandonment, the pit was filled with garbage, consisting of large thick potsherds and brickbats. Structure No. 3F was probably another storage room of the complex.

Structure No. 3G

This is one of the largest rooms of the complex, located immediately east of the central open courtyard. Structure No. 3G also includes an antechamber in its northwest corner and a number of partition walls inside (Figure 82). The total area occupied by this structure was 13.60 m from north to south and 7.40 m from east to west. All four walls of this structure have been excavated. The antechamber of this structure is rectangular in plan, oriented roughly in the northeast-southwest direction. It is to the west of Structure No. 3F. This chamber measures 3.10 m from east to west and 1.95 m from north to south along its inner edge. The western wall of Structure No. 3F forms the eastern wall of the chamber whereas parts of the southern walls of Structure Nos. 3A and 3C form its northern wall. The western wall of the chamber extends towards the south to form a part of the western wall of the entire structure (Structure No. 3G). The southern partition wall, located to the west of the antechamber, runs in the east-west direction and is made of a single line of vertically arranged bricks. The size of these bricks is 34 × 17 × 8.5 cm. The wall is 34 cm broad and 1.90 m long from east to west. It appears to have been cut by later disturbances towards its eastern end, giving the impression of an opening and forming a small room within the structure.

Inside the main portion of Structure No. 3G is an L-shaped partition wall running from the middle of the inner side of the western wall. The vertical segment of the L-shaped wall is located 4.85 m north of the southern wall, and the horizontal segment that turnes toward the north is 4.30 m to the west of the eastern wall. The average thickness of this L-shaped partition wall is 50 cm and has survived to a thickness of 8 cm. The length of the vertical portion of the partition wall is 2.10 m, whereas that of the horizontal portion is 2.70 m. Along the eastern margin of the horizontal partition wall are two rectangular fireplaces, located side by side and separated by a single course of bricks arranged in the north-south direction (Figure 5.83). The fireplace on the southern side is damaged in its southern portion, whereas the northern one is almost entirely intact. The northern fireplace measures 80 cm from north to south and 65 cm from east to west. It is quite likely that the southern fireplace



Figure 5.82 St. no. 3G with antechamber, partition walls and fireplaces, from northwest



Figure 5.83 Fireplaces in St. no. 3G, from northwest

had the same dimensions before it was damaged. The northern fireplace is protected to the north by a small mud-brick wall that is 30 cm in width. This fireplace protection wall runs in the east-west direction. Its eastern end is not intact It survived to a length of 37 cm from east to west. Here it appears that there was once a similar wall running from east to west on the southern side of the southern fireplace, fragments of which have survived. It was slightly thicker (40 cm) compared to the wall to the north of the northern fireplace, and is intact to a length of 1.10 m. From the middle of the southern fire protection wall emanates a small mud-brick wall running towards the north, which is visible to a length of 1.30 m and a width of 35 cm. The exact function of this wall cannot be determined as it is damaged towards its northern end.

The well-made floor of this structure was badly damaged due to later disturbances. Three pits and a number of depressions have cut the structure. Of the three pits, two, one small and one large are located near the structure's southern wall. The large pit, which is located 45 cm north of the southern wall and 1.60 m west of the eastern wall, has a diameter of 1.15 m and a depth of 65 cm. It is perfectly circular on plan, yielding Harappan and Early Historic mixed pottery. At a distance of 15 cm to its north is a roughly oval-shaped pit that measures 95 cm from east to west and 80 cm from north to south. The third pit is located 45 cm to the west of the eastern wall and 2.60 m to the south of the northern wall. It is also perfectly cylindrical with a diameter of 1.30 m. This pit has not been excavated, but considering its cylindrical nature, it may have been a storage pit from a later period. In the southwestern corner of the structure, 20 cm to the north of the southern wall and 1.17 m to the east of the western wall, is a large storage jar fragment with a flat, narrow base.

All four walls of Structure No. 3G are well preserved. The eastern wall is 10 m long from north to south and its average width is 50 cm. It has survived to a height of 10 cm. The western walls of Structure Nos. 3I and 3L form the eastern wall of this structure. The southern wall is 6.90 m long from east to west, made of single course of bricks, and measures 30 cm in breadth. It has survived to a height of 20 cm, and forms the northern wall of Structure No. 3H. The western wall of the structure is 11.55 m long from north to south, excluding the antechamber. The average width of the wall is 50 cm and is intact to a thickness of 16 cm. It forms the eastern wall of Structure No. 3J. The southern wall of Structure No. 3F forms the northern wall of this structure. This wall runs towards the west for a distance of 3.85 m and then turns towards to the north to form the eastern wall of the antechamber. The average thickness of the wall is 70 cm and it has survived to a thickness of 18 cm. Two courses of bricks were exposed.

Considering its large size, well-made floor, antechamber, and two fireplaces, this hall-like structure could have been used for cooking and storage purposes.

Structure No. 3H

This structure is located in the northwestern corner of the excavated complex (Figure 5.84). It is to the west of Structure Nos. 3C, 3B and the antechamber of Structure No. 3G. It is a large hall-like structure that has been only partially excavated. The excavated area of the structure measures 8.60 m from north to south and 8.50 m from east to west. It continues towards the north and west in unexcavated trenches and therefore its total dimension are not yet known. Only the southern and eastern walls have been partially excavated. The western walls of Structure Nos. 3B, 3C and the antechamber of Structure No. 3G form the eastern wall of this structure. It has been excavated to a length of 8.80 m from north to south. The average width of the wall varies with neighboring structures to the east. The southern wall has been excavated to a length of 10.30 m from east to west. Its average width is 50 cm, but it thickens to 75 cm towards its western end for a length of 3.20 m on its inner side. The wall



Figure 5.84 St. no. 3H showing a small partition wall and a later pit, from northwest



Figure 5.85 Details of Structure 3H1

has survived to a height of 10 cm. There appears to be a partition wall located 5.05 m to the north of the southern wall near its western end. It is a small and thin, oriented from southwest to northeast and has been excavated to a length of 1.50 m. This is made of a single course of horizontally placed bricks. The average width of the wall is 35 cm and it has survived to a height of 10 cm. There is a huge square pit located more towards its western side, spreading over an area of 3.90 m by 3.90 m. This pit is a later addition. It has damaged the floor level of the structure (Figure 5.84). One of the important finds from this pit is a broken steatite seal engraved with a humped bull and a few Harappan signs. There are also potsherds in this structure that bear possible Harappan letters. The exact function of the structure cannot be identified, as it is not exposed in its entirety. As it is devoid of any other features and has relatively well made floors, it may be another dwelling area of the complex.

Structure No. 3H1

This is an extension of Structure No. 3H, located in Trench 1B7. Structure No. 3H is a big hall, which was divided into two parts towards it western side. The dividing wall is 3 m in length with an average width of 65 cm, but only its basal course has survived (Figure 5.85). The area enclosed is 2.80 m from east to west and 3 m from north to south. It has a well-made floor of bricks and brickbats, which is plastered along its northern edge. It has been damaged by a later pit with a diameter of 2.30 m. The western wall of the structure was excavated to a length of 4.60 m and has an average width of 60 cm. It has survived to a height of 20 cm, with two courses of bricks apparent. There are two postholes in the wall along its eastern margin; the first lies 1 m to the north of the southern end with a diameter of 20 cm and the other is 1.58 m to the north of the first, with a diameter 20 cm. Besides, there are two large pits in the wall along its western margin. One lies 1.68 m to the west of the southern end and the other is 1.80 m to the north of the first one. The diameter of the first one is 30 cm and the diameter of the second one is 40 cm. Both appear to be later pits. The northern periphery of this room has not been excavated.

Structure No. 3H2

Structure No. 3H2 is located in the northwest quadrant of 1B7 and northeast quadrant of 1B8. Save for its northern half, it has been fully excavated and appears to consist of two clear building phases. In the earlier phase, the structure was slightly bigger, but in the later phase it was made smaller by adding partition walls (Figure 5.86). A length of 1.70 m of the northern portion of the western wall of Structure No. 3H1 forms the eastern wall of Structure No. 3H2 during its earlier phase. The southern wall 3.80 m long, 67 cm wide, and has survived to a height of 12 cm. On the western end is a posthole that is 36 cm east of the western end of the structure and 26 cm to the north of the southern edge of the wall. It has a diameter of 30 cm. There is a small depression in the wall 50 cm to the east of the posthole and along the southern margin. This depression appears to be a small oblong pit measuring 26 cm from north to south and 22 cm from east to west. It belongs to a later date. The western wall, which is excavated for the length of 2.80 m, is 40 cm wide and has survived to a height of 10 cm. There is a large posthole in the wall located 1.53 m to the north of the southern end, with a diameter of 30 cm. During the first phase, the interior of the structure measures 2.70 m from east to west and the north to south length of the excavated area measures 1.50 m.

The east to west area of the structure in the second phase was reduced to 1.54 m and its excavated area measures 1.07 m from north to south. The later eastern wall added to the inner margin of the eastern wall from the earlier phase. It has been excavated to length of 1.20 m. It is 60 cm in width and has survived to a height of 16 cm. Along its eastern edge, at the distance of 46 cm from the southern end of the wall, is a posthole that has a diameter 19 cm. The southern wall



Figure 5.86 Details of Structures 3H2, 3H3 and 3H5



Figure 5.87 Details of Structure 3H4

is 1.58 m in length and 40 cm wide. It has survived to a height of 13 cm. The western wall was excavated to a length of 1.32 m and is 73 cm wide, surviving to a height of 15 cm. The northern edge of the structure has not been excavated. The floor inside is well made. Considering its small size, this structure may have been used as another storage place for the complex.

Structure No. 3H3

This is a well-preserved structure (Figure 5.86). All four of its walls have been excavated. It falls in the western half of Trench 1B7 and the eastern half of Trench 1B8. The southern part of the western wall of Structure No. 3H1 (3.70 m in length) forms the eastern wall of this structure. The southern wall from an early phase of Structure No. 3H forms the northern and western wall of this structure, which has been partially destroyed at the northern end by later pit (3.80 m long). It has an average width of 55 cm and has survived to maximum height of 13 cm. Near its northern end is a posthole along its inner margin, which is 1.10 m to the south of the northern end and has a diameter of 20 cm. The southern wall of the structure, which is 4.20 m long and 62 cm wide, has survived to maximum height of 24 cm and is relatively well preserved. The area enclosed by the structure is 2.40 m from north to south and 3.20 m from east to west, with a well-made floor of bricks and brickbats. A large pit belonging to a later date has destroyed the western half of the floor.

Outside the structure on its southern side is an extension running along the outer margin of the southern wall. It is in the northern half of Trench 1C7 and northeast quadrant of 1C8. It runs towards the eastern section of the wall, where the wall is flat and probably indicates an entrance. This extension was probably a veranda that was enclosed by a thin mud-brick wall on all sides. It is 3.40 m long from east to west and 1.10 m wide from north to south. The wall has survived to a height of 14 cm and is 30 cm wide. The enclosure is made of a single row of vertically-placed bricks. Inside this veranda is a small enclosure, 60 cm to the west of the inner face of the eastern wall and 25 cm to the north of the inner face of the southern enclosure wall. It is made of a single row of bricks that were placed horizontally. The exact function of this small enclosure within the veranda is hard to determine.

Structure No. 3H4

To the south of the veranda of Structure No. 3H3 and to north of Structure Nos. 3Y and 3Y1 is an open passage that has been assigned Structure No. 3H4. It is spans Trench 1C7 and the eastern part of 1C8. It is 2.45 m wide from north to south and 4.10 m long from east to west. Towards its western side it opens into a lane that runs parallel to the drainage toward the west. This was probably an entrance to the western side of Structure Complex 3. Two other entrances to this complex have been found on the eastern side that open into the main street. Since this is a huge complex, a number of entry points were necessary.

Structure No. 3H5

To the west of Structure No. 3H2 and east of the bathroom of Structure Complex 6 is an open space that has been treated as a separate room (Figure 5.86). The area enclosed appears to be 1.90 m from east to west and 2.90 m from north to south. It may extend towards the north into the unexcavated area. It appears to be a gap between Structure Complexes 3 and 6.

Structure No. 3I

This structure, located to the south of Structure Nos. 3D and 3E and to the west of Main Street, is very important (Figure 5.88). It contains a number of intact features including a mud-brick platform and a floor. The area enclosed by this structure measures 4.50 m from east to west and 6 m from north to south. It is roughly rectangular, oriented northwest to southeast.

The southern wall of Structure Nos. 3D and 3E



Figure 5.88 St. no. 3I showing details of features inside and buttresses, from southeast

form the northern wall of this structure. This wall is 5.90 m from east to west and its average width is 70 cm. It has survived to a height of 10 cm. The eastern wall is 7.70 m long from north to south with an average width of 60 cm, surviving to a maximum height of 20 cm. This is one of the best-preserved walls in the complex, which was strengthened at a later stage with a parallel wall on its outer surface. This addition is 55 cm broad, and has survived to a length of 2.10 m from north to south along the southeastern corner of the wall. It may have been added later in order to strengthen or repair the wall. This additional wall actually encroaches on the street, which strongly suggests that it was added to the structure after its original construction. Its appearance may indicate that the street lost importance sometime after the construction of the complex.

The southern wall of the structure also had a parallel line of bricks added to its outer surface. The original wall is 5.60 m long from east to west and 70 cm broad, whereas the later addition is 6.15 m long from east to west and 35 cm broad. This addition is made of a single line of vertical bricks. It is contemporary to the additional wall added to the eastern wall of the structure.

The western wall of the complex, which is also the eastern wall of Structure No. 3G, is 7.70 m long from north to south and its average width is 60 cm. It has survived to a maximum thickness of 14 cm towards its northern side, whereas only the basal course of bricks has survived towards the southern side (Figure 5.88). Inside the eastern half of the structure is a platform made of bricks. This platform covers an area of 2 m from east to west and 5.50 m from north to south.

On this platform are two rectangular pits along its southern margin. The one located to the southeastern corner is 85 cm by 85 cm and has survived to a depth of 18 cm. At a distance of 60 cm to its west is yet another rectangular pit, which is slightly smaller in size measuring 65 cm by 65 cm. It has survived to a



Figure 5.89 Rectangular fireplace and two storage pots in St. no. 3I, from southeast



Figure 5.90 St. no. 3K showing locations of a fireplace and a small rectangular storage pit, from northeast

depth of 20 cm. These pits may have been used for storage. To the west of the platform at a distance of 45 cm from its edge and 25 cm to the north of the southern wall is another rectangular pit lined with bricks. Two courses of bricks measuring 15 cm high have been identified. The total size of the pit is 80 cm from north to south and 1 m from east to west. Its inner dimensions are 65 cm from east to west and 50 cm from north to south. The space between the edge of the platform and the pit is also covered with a mud-brick floor. The pit had clay lining its inner surface, suggesting that it was used for water storage.

A well-made rectangular fire place is located inside the structure, 2 m to the west of the eastern wall and 1.50 m to the south of the northern wall of the structure. It measures 87 cm by 87 cm with an inner space measuring 50 cm from east to west and 60 cm from north to south. It was found intact to a depth of 15 cm. It is lined with single course of bricks on three sides and has an opening on the southern side. The inner surface of the fireplace was lined with clay, which is burnt red. It has a slightly sagging base, which is also burnt red (Figure 5.89). Considering the apparent burning of its sides and bottom, it is quite clear that the fireplace was in constant use for a long period of time. Though large, it appears to be a domestic hearth as it is open on the southern side. To fit pots of different sizes on this hearth, the Harappans could have used clay or stone supports.

Two pots were found close to the fire place, one at its mouth and the other 80 cm to its west along the western wall. These, however, belong to two different periods. The one located near its mouth is a globular pot belonging to a later phase. The other, west of the fireplace is a large storage jar with a tapering end and narrow flat bottom. It predates the structure as it is cut by one of the structure's walls. Both pots are of the Red ware variety. At a distance of 50 cm to the north of the rectangular pit that the team believes was used for water storage is the base of a fireplace. All that remains of this fireplace is a burnt red patch. It is roughly rectangular, oriented in the north-south direction and measuring 60 cm from north to south and 45 cm from east to west. It is the base of a later fireplace. On the basis of the fireplace, rectangular pits, and mud-brick platform, the team believes that this structure served as a kitchen for the complex.

Structure No. 3K

This structure, which is as long as Structure No. 3J (the central open courtyard), is located to the western margin of the excavated area (Figure 5.90). It is rectangular in plan, measuring 9.40 m from north to south and 5.20 m from east to west. The western wall and western section of the northern wall have not been excavated. A very small portion of the southwestern corner has been exposed. The western wall of Structure No. 3J forms the eastern wall of this structure. The southern wall, which survives to a height of 15 cm, 5.85 m from north to south and its width varies from 80 cm in the east to 1.15 m in the west. The portion of the wall that forms the northern wall of Structure No. 3R is 80 cm in width and the section that forms the northern wall of Structure No. 3T is 1.15 m. Both of these structures are located to the south of Structure No. 3K. Its western wall has been excavated to a length of 65 cm near its southwestern corner (Figure 5.90).

In the southeastern corner of the structure is a mud-brick platform oriented in the north-south direction. It is 2.25 m in length,1.40 m in width and has survived to a height of 15 cm. This could be a sitting platform for the interior of the structure. In the northeastern corner of the structure is an oval fireplace oriented in the north-south direction. It is located 20 cm to the west of the eastern wall and 65 cm to the south of the northern wall. The oval fireplace is 90 cm long from north to south and 50 cm broad. It has survived to a depth of 10 cm. The area between the fireplace and the wall is paved with bricks, suggesting that they are contemporary. The sides and bottom of the pit are burnt red, suggesting



Figure 5.91　Fireplace in St. no. 3K, from southeast



Figure 5.92　St. nos. 3L and 3I, from southeast

its constant and long use (Figure 5.91).

In the middle of the structure appears to be a partition wall made of a single line of bricks. It is located 4 m to the south of the northern wall. The wall runs in the east-west direction and divides the structure in two, the northern partition being 4 m and southern 5.15 m along its inner edge. The wall was excavated to a length of 2.75 m and is 30 cm broad. Only traces of it survive. It was cut by a later disturbance towards its eastern end. 10 cm to its south and 1.70 m west of the eastern wall is a small circular pit that is 80 cm in diameter. It appears to be a later pit, and has yet not been excavated. At a distance of 3.10 m to the south of the northeastern corner is a 1.15 m wide opening in the eastern wall. The eastern wall joins the central courtyard (Structure No. 3J) and Structure No. 3K, and the opening must have served as a portal between the two. The opening has a step-like feature, which is 10 cm from its base. This strengthens the view that Structure No. 3J was a central courtyard, as there seems to have been entry to this courtyard from all four directions.

Structure No. 3L

Between Structure Nos. 3I and 3M is a rectangular passage open towards its eastern end and closed towards its western end. The passage encloses and area 5.65 m from east to west and 2.10 m from north to south. The southern wall of Structure No. 3I forms the northern border and the northern wall of Structure No. 3M and the southern border of this structure. It is devoid of any features but has a very well-made rammed floor made of mud, brickbats and mud-bricks. This passage could be a common space used by the occupants of Structure Nos. 3I and 3M. also It may also be the entrance to Structure Complex No. 3 (Figure 5.92).

Structure No. 3M

This is a large rectangular structure oriented in the east-west direction (Figure 5.93). It is south of Structure Nos. 3L and 3G. It measures 8.35 m from east to west and 3.05 m from north to south. The eastern wall of structure runs parallel to the western margin of Main Street. It is 4.10 m from north to south and 60 cm wide. It has survived to a height of 15 cm. The northern wall is 9.25 m from east to west. The southern margin of Structure No. 3L forms the northern wall for a length of 5.30 m and is 50 cm broad, whereas part of the southern wall of Structure No. 3G forms the remaining part of this wall for a length of 3.95 m from east to west. It is 30 cm broad, and made of a single line of vertically placed mud-bricks. The northern wall has survived to a thickness of 15 cm. The southern wall of the structure, of which a major portion of its western end is cut, runs from east to west for 9.25 m. The northern wall of Structure No. 3N, which forms eastern part of the southern wall of this structure for a length of 4.20 m, is 60 cm broad. The remaining portion of the western end of the wall has been destroyed entirely, save for a small (52 cm) section that at the junction with the southwestern corner. Towards the western end the wall has survived to a height of 25 cm, whereas 15 cm survives towards its eastern end. The western wall of the structure, which also forms the eastern wall of Structure No. 3P, runs north to south for 4.40 m. It is made of a single line of vertical bricks. It is 30 cm in width and survived to a thickness of 20 cm (Figure 5.93). At a distance of 1.20 m to the north of the southern wall is a feature made of mud-brick running in the east-west direction. It looks like a wall tapering toward the west. It has survived to a total length of 1.60 m from east to west, 55 cm broad towards its eastern end and 40 cm towards its western end.

It is quite likely that there was a mud platform in this part of the structure, some portion of which may have been cut by a later pit on its southern side. There is a rectangular fireplace along the inner margin of the northern wall, 1.80 m to the west of the northeastern corner. To its west is another fireplace in the same alignment separated by a small rectangular platform



Figure 5.93 St. nos. 3M, 3N and 3Q, from northeast



Figure 5.94 Astragali (tarsal bones) of cattle in St. no. 3M

measuring 70 cm from east to west and 45 cm from north to south. The eastern fireplace, rectangular in shape and running east to west along the margin of the wall, is 1 m in length from east to west and 55 cm in breadth from north to south. It has a clay wall around 20 cm thick along its eastern margin, which has survived to a height of 7 cm. The fireplace is open towards its southern side and is 20 cm deep. The sides and bottom of the pits are burnt red. A later circular pit that is 50 cm in diameter cuts into the soutern margin of the fireplace. The fireplace on the western side is small and irregular in shape due to later disturbances.

The structure has a well-made floor composed of brick and brickbats. It has been damaged by later pits. On the surface of the floor near its northeastern corner, 1 m to the west of the eastern wall and 50 cm to the south of the northern wall, nine well-preserved cattle astragali (tarsal bones) (Figure 5.94) were found. These bones are from the non-meat bearing parts of the animal, which may have been discarded in the pit. They represent six animals (confirmed by archaeozoologist Dr. P.P. Joglekar). At the western end of the platform along its southern margin is a long narrow dish-on-stand, which is contemporary with the structure. There is a pot from a later period in the northwest corner of the structure. The later pot is a coarse Red war storage jar of medium size with a circumference of 50 cm, the upper part of which is missing. This structure could have been used for cooking.

Structure No. 3N

This small square structure located at the junction of Main Street and Lane No. 1 on the southern side of Structure No. 3M is a small room with well-made walls and floor (Figure 5.95). The dimensions of the structure on its inner edge measure 3 m from east to west and 2.45 m from north to south. The southern wall of Structure No. 3M forms the northern wall of the structure. It is 4.15 m from east to west in length, 55 cm broad, and has survived to a height of 25 cm. The western wall is 3.70 m long from north to south and 60 cm broad, also forming the eastern wall of Structure No. 3Q. The wall has survived to a height of 30 cm with three courses of bricks apparent. The eastern wall, which runs parallel to Main Street, is 3.60 m long from north to south and 55 cm broad. The middle of the wall has been partially destroyed by a later pit. The pit is located 65 cm to the north of the southern wall (from the inner edge). It is a large circular pit with a diameter of 1.40 m and a depth of 50 cm.

In the northwestern corner of the structure is a small rectangular fireplace. It is located along the inner face of the northern wall, 30 cm to the east of the western wall. It measures 45 cm from east to west and 30 cm from north to south. It is 20 cm deep. The corners of the pit are rounded. The sides and the bottom of the pit are burnt red. This structure has a well-made floor that has been smoothed by plastering. It has developed a concavity in the middle and was repaired periodically, evidence of which is apparent.

At the junction of Main Street and Lane No. 1 at the southeastern corner of the structure is a rectangular platform attached to the complex's external wall near the eastern end of the southern wall. This platform, measuring 1.90 m from east to west and 75 cm from north to south, may have been built so that the complex's inhabitants had a place to sit in the square formed by the street intersection. It should be noted that similar kinds of architectural features are made in present villages and towns.

Structure No. 3O

Located to the west of Structure No. 3Q and south of Structure No. 3P is one of the best-preserved structures of the complex (Figure 5.96). All four walls of the structure are well preserved along with an associated high quality floor. It is oriented in the north-south direction and occupies an area of 2.70 m from north to south and 1.75 m from east to west. The



Figure 5.95 St. no. 3N, from northeast



Figure 5.96 St. nos. 3O, 3S, 3P and 3R, from northwest

eastern wall of the structure, consisting of three brick courses, has survived to a height of 25 cm. This wall forms the western wall of Structure No. 3Q. It is 3.73 m long and its average width is 60 cm. The northern wall, which is also the southern wall of Structure No. 3P, is 3 m long from east to west and 65 cm wide. It has survived to a thickness of 30 cm. The western wall, which is 4 m in length and 60 cm in width, has survived to a height of 30 cm. Four brick courses from the western wall are apparent. No features were found inside, but there is a flimsy yet smooth floor. Considering its size, this structure was probably used as a storage room.

Structure No. 3P

This is one of the smaller rooms of this complex, located to the north of Structure No. 3O. It covers an area of 2.65 m from north to south and 2.15 m from east to west (Figure 5.96). The northern wall of Structure No. 3O forms the southern wall of this structure. The eastern wall, 3.80 m long from north to south and 30 cm wide, is made of single vertical line of bricks. In the middle of this wall, at a distance of 1.80 m from the northeastern corner, is a circular posthole with a diameter of 7 cm. Given the thinness of this wall, additional support in the form of posts or pillars must have been necessary to support the structure's roof. This wall has survived to a height of 20 cm and is with Structure No. 3M. The northern wall, which is 2.95 m long and 45 cm broad, has survived to a height of 7 cm. It is separated by 37 cm from the southern wall of Structure No. 3G. This indicates that it was not a common wall between them but built separately for this structure. The western wall of the structure that lies between the northern wall and Structure No. 3R was also independent of the other structures. It is 3.80 m long and 50 cm wide. It has survived to a maximum height of 10 cm. In the middle of the junction of south and west walls is a circular post-hole with a diameter of 15 cm. Sections of this structure's well made floor of mud-bricks have survived. Other parts of the floor were cut by later disturbances. In the middle of the floor, 75 cm to the west of the east wall and 85 cm to the north of the southern wall, is a perfectly circular but shallow pit with smooth sides and bottom. It has a diameter of 80 cm and a depth of 15 cm. It is contemporary to this structure. In addition, there was possibly a small storage chamber located along the northern wall. It measures 2 m from east to west and 65 cm from north to south along its inner edge. This could be another storage structure of the complex, surviving to a thickness of 10 cm.

Structure No. 3Q

To the west of Structure No. 3N and north of Lane No. 1 is a rectangular structure oriented in the north-south direction (Figure 5.93). All four walls are evident, but the northern wall was destroyed by later pits. The western wall of Structure No. 3N forms the eastern wall of this structure. The eastern wall of Structure No. 3O comprises this structure's western wall and the southern wall of Structure No. 3M is its northern wall. The southern wall running parallel to the lane is 5.70 m long and 60 cm wide. It has survived to a height of 20 cm, three brick courses evident from the inner side. The area enclosed by this structure is 4.55 m from east to west and 2.55 m from north to south. In the southeastern corner is a square mud-brick platform measuring 1.40 m from north to south and 1.20 m from east to west. The nature of the floor is not visible as it is badly damaged. The exact function of this structure is not clear, but it was probably used for a dwelling purpose.

Structure No. 3R

To the west of Structure No. 3P and north of Structure No. 3S is a small square structure enclosing an area of 2.25 m from east to west and 2.50 m from north to south (Figure 5.96). The eastern wall of this structure is an independent wall built along the western wall of Structure No. 3P. It is 3.70 m from north to south and 80 cm broad. It has survived to a

height of 15 cm. The southern wall, which is made of a single line of bricks, is 3.75 m from east to west and 35 cm in width. It has survived to a height of 10 cm. The western wall, 3.90 m from north to south and 65 cm wide, lies between this structure and Structure No. 3T. It has survived to a height of 15 cm. There is a rectangular chamber made of a single line of vertical mud-bricks. It is located along the length of the southern wall, 10 cm to the east of the western wall. The eastern part has been displaced by later disturbances. The area enclosed by this chamber is 53 cm from north to south and 1.10 m from east to west. This 12 cm deep chamber is plastered on the inner side and could have been used for water storage. The floor of this structure is made of brickbats and clay, rammed hard. This could be an additional room for Structure No. 3T, which may have been one of the kitchens of the complex.

Structure No. 3S

This square structure is located to the west of Structure No. 3O and north of Lane No. 1 (Figure 5.96). Its eastern wall is built parallel to the western wall of Structure No. 3O. It is 3.80 m long from north to south and 50 cm broad and has survived to a height of 18 cm. The southern wall that runs parallel to the lane is 4 m long from east to west and 50 cm wide. It has survived to a height of 10 cm. The western wall, built parallel to the eastern wall of Structure No. 3T, is 3.80 m long and 35 cm broad. It has survived to a thickness of 20 cm. The area enclosed is 3 m from north to south and 2.65 m from east to west. This structure also has a hard well-made floor and could have been used as another storage room, as it is devoid of any other features and too small to be used for dwelling purposes.

Structure No. 3T

To the west of Structure Nos.. 3R, 3S and north of Lane No. 1 is Structure No. 3T, which is roughly square in plan (Figure 5.97). The western walls of Structure Nos. 3R and 3S form the eastern wall of this structure, which is 7.70 m long from north to south and 70 cm wide. It was found intact to a height of 15 cm. The inner face of this wall towards the northern side was broadened to 80 cm for a length of 2.60 m, which has survived to a height of 20 cm. The broadened wall may have served as a sitting bench inside the structure. The northern wall is 8.90 m long, 60 cm wide and has survived to a height of 20 cm. This wall is shared by Structure Nos. 3J and 3K. The western wall, which forms the eastern walls of Structure Nos. 3U and 3V, is 8.20 m long from north to south. Its width varies from 80 cm towards the southern end to 1 m towards the northern end. The wall has survived to a height of 20 cm. The southern wall is 8.40 m long, 80 cm broad and has survived to a thickness of 20 cm (Figure 5.97). The western end of the wall's outer edge was damaged towards its western end by a later pit. This pit contained large and small potsherds and numerous animal bones, including an almost complete bovine skull (Figure 5.98).

Inside the structure, 2.30 m to the north of the southern wall, is a partition wall running straight along the inner edge of the western wall towards the east for a distance of 3.80 m. It then forms a right angle, turning towards the north for a distance of 1.50 m. This L-shaped partition wall has survived to an average height of 45 cm. This divides the structure into three parts, each part of which was used for different activities. The enclosed space on the northern side of the partition may have been used for storage as it contains a cylindrical storage silo. This silo is 1.75 m to the north of the partition wall and 1.25 m to the east of the western wall. It is perfectly cylindrical, with a diameter of 1.30 m and a depth of 75 cm (Figure 5.97). Evidence of two fireplaces, one located in the eastern and the other in the southern parts of the structure, indicate that the structure may have served as a kitchen. In the structure's northeastern corner, along the inner margin of the eastern wall is a rectangular fireplace. It is 70 cm to



Figure 5.97 St. nos. 3T, 3U and 3V, from northwest



Figure 5.98 Garbage dump in Lane no. 1, from southwest



Figure 5.99 Double fire-pit with a pot in St. no. 3T, from northwest



Figure 5.100 Passage to Household no. 1 with two flights of steps from Main Street, from northeast

the south of the northern wall. It measures 70 cm from north to south, 40 cm from east to west and has survived to a depth of 15 cm. The clay plastered on the sides and bottom is burnt red due to constant use. The fireplace is lined with bricks on the northern and the western sides. The total size of the fireplace, including its brick lining, is 1 m by 60 cm. The fireplace has an opening towards its southern side.

There are two medium sized globular Red ware pots located in the vicinity of this fireplace. One of them is 5 cm to the west of the outer margin of the fireplace. They were placed on a rectangular platform, measuring 1.60 m from north to south and 1.20 m from east to west. The platform was found intact to a height of 12 cm. A double rectangular fireplace separated by a single line of vertical bricks was identified along the inner margin of the southern wall. The eastern margin of this fireplace is 2.30 m to the west of the eastern wall. The total area covered by this double fireplace along its the inner edge is 1.30 m from east to west and 80 cm from north to south. It is lined with bricks along its eastern and western margins, whereas it is open towards its northern end. The middle partition brick wall of this fireplace is 80 cm from north to south and 15 cm broad. Both faces of the partition wall and the inner faces of the margin walls are plastered and burnt red (Figure 5.99). At a distance of 20 cm to the west of the western margin of the fireplace s a small cylindrical pit (65 cm in diameter) that could be contemporary with the fireplace. This pit has not been fully excavated. 20 cm to its west is yet another cylindrical pit with a diameter of 1.20 m. Both these pits are perfectly cylindrical in shape and were probably used as storage pits. The latter pit has a well-made, smooth but flimsy floor. One family may have occupied this structure, which has storage as well as cooking facilities.

Structure No. 3U

To the west of Structure No. 3T are two structures: Structure No. 3U and 3V (Figure 5.101). Structure No. 3U lies to the north of Structure No. 3V. It is a rectangular structure oriented in the north-south direction, enclosing an area of 3.15 m from north to south and 2.40 m from east to west. The eastern wall of the structure is 5.25 m from north to south and 90 cm wide. It was found intact to a height of 12 cm. The eastern wall of Structure No. 3U is part of western wall of Structure No. 3T. The northern wall, which has survived to a height of 12 cm, was exposed to a length of 3.40 m, a very small portion of which continues further west into an unexcavated section. This forms the western portion of the southern wall of Structure No. 3K. The western wall, which was exposed to a length of 4.10 m, has an average width of 95 cm. It has survived to a thickness of 10 cm. The southern wall, which was shared between this structure and Structure No. 3V, is 4.30 m long and 1.10 m broad. This wall has survived to a height of 10 cm (Figure 5.97). This structure is devoid of any features and could have served as another storage place of the complex.

Veranda of Structure No. 3U

To the west of the Structure No. 3U on its outer side was excavated a small rectangular enclosure (Figure 5.97). This enclosure falls in the northeast and southeast quadrants of Trench 1F7 and the southeast quadrant of 1E7. The total area enclosed by this structure measures 2.50 m from north to south and 90 cm from east to west. The western wall of Structure No. 3U forms its eastern wall. The northern wall is 1.70 m long and 70 cm wide. It has survived to a height of 16 cm. The western wall has survived for a length of 3.80 m, and is 36 cm wide with a surviving height of 18 cm. It has a well-made floor and in all likelihood was open on the southern side. This portion of the structure belongs to Structure No. 3U and may have been used as a veranda. A large pot was noticed in the along the inner margin of its eastern wall, located 2.90 m to the south of the inner face of northern wall. It is a globular storage jar of a fine red variety with flat narrow



Figure 5.101 Details of Structure 3U
The verandah of this room was excavated in 2008-09



Figure 5.102 Details of Structure 3W

base. This may have been used to store drinking water. This tradition exists even today in this region.

Structure No. 3V

To the south of Structure No. 3U and north of Lane No. 1 is a small square structure. The southern wall of Structure No. 3U forms the northern wall of this structure. The eastern wall is 4.20 m long and 70 cm in width and forms the southern portion of the western wall of Structure No. 3T. It has survived to a height of 15 cm. The southern wall that runs parallel to the lane is 5.50 m long from east to west and 65 cm broad. It has survived to a height of 20 cm. The western wall of the structure, which is 4.30 m in length and 60 m wide, has survived to a height of 15 cm. The area enclosed by the structure is 2.50 m from north to south and 2.50 m from east to west. This structure has a well-made hard floor (Figure 97). Considering its size and the absence of other features, this could be another storage area of the complex.

Structure No. 3W

Structure No. 3W is another room belonging to Structure Complex 3, located west of Structure No. 3K and east of Structure No. 32 (Figure 5.102). It falls within Trench 1E7. The western wall of Structure No. 3K forms its eastern wall. It was fully excavated. It is 4.05 m long, 55 cm wide, and has survived to a maximum height of 20 cm, with two courses of bricks apparent. The southern wall, which cuts towards its western end, was originally 3.80 m long and 63 cm wide. Its surviving height is 17 cm. The western wall, the southern end of which is cut by a pit 3.60 m in diameter, is 66 cm wide with a surviving height of 16 cm. The average size of the bricks used to build this structure is 32 × 16 × 8 cm. There is a large posthole at the northern end of the wall which is slightly oblong 40 cm × 28 cm. Since it is located in corner of the wall, which is probably contemporary to the structure. The northern wall is 3.85 m long, 45 cm wide, and has survived to a height of 17 cm. The area enclosed by the structure is 2.60 from north to south and 2.67 m from east to west. It has an uneven and poorly made floor. Within the structure, 18 cm to the north of the southern wall and 90 cm to the west of the eastern wall, lies a roughly square slab of basalt that measures 27 cm × 27 cm and has a flat surface. Considering the uneven floor and presence of the stone it is possible that some craft activity was carried out in this area, though it not clearly reflected in the other materials found within this room. The size of the room indicates that one or two craftsmen may have occupied it simultaneously. This is the only room of the complex that can be associated with any kind of craft activity. Considering the size of the complex, it may have been associated with craft activities.

Structure No. 3X

Structure No. 3X is located to the north of Structure No. 3W and appears to be an enclosed courtyard belonging to Structure No. 3W. It is located in the southwest quadrant of Trench 1D6, the northwest quadrant of Trench 1E6, the southern half of 1D7 and the northern half of 1E7. It is an elongated structure with interior measurements of 4.10 m from east to west and 1.40 m from north to south. It was divided into two parts by a partition wall, which was placed 2.30 m from the outer edge of the eastern wall (Figure 5.103). It is made of a single row of horizontally-placed bricks. The area east of the partition wall measures 1.90 m from east to west and 1.10 m from north to south, while the western side is 1.90 m from east to west and 1.50 m from north to south. There is an opening of 1.30 m in the enclosure wall towards the northwest corner, which could be an entry point to Structure No. 3W. The northern and eastern walls are made of large, wedge-shaped burnt bricks and clay. The wedge shaped bricks measure 33 cm in length, 26 cm width at the broad end and 22 cm at the narrow end. Each brick is 9 cm thick. Considering the smoothed surface of the bricks it appears there was no wall over this portion of the structure. The northern wall was exca-



Figure 5.103 Details of Structure 3X



Figure 5.104 Extension of Structure Complex 3 on the west

vated to a length of 3.25 m and 20 cm in height. The eastern wall is 1.90 m long and similar to the northern wall.

Though this structure is associated with Structure Complex 3, it probably had a separate entry through Structure No. 3Y1, which connects to the western entry (Structure No. 3H4) of Structure Complex 3. At the end of the drainage, the passage (Structure No. 3H4) bifurcates into two entry points, one leading straight east to the main complex and the other turning south into Structure No. 3W.

Structure No. 3Y

Structure No. 3Y is located south of the passage (Structure No. 3H4) and north of Structure No. 3X (Figure 5.105). It falls within the southern halve of Trench 1C7 and 1D7, and along the western edge of 1D6. Due to disturbance from Early Historic pits, its northest and southwest corners have been destroyed. The pit, which has destroyed the southwest corner of the structure, has diameter of 1.4 m, whereas the other pit, which has destroyed northeast corner, has a diameter 1.90 m. All four walls of this structure are broad and have been identified. The southern wall is 3.50 m long, 85 cm broad and has survived to a height of 15 cm. It is made of three rows of bricks, the southern most edge made of bricks that were placed horizontally whereas the other two rows in the north were made by placing bricks vertically. The average size of each brick is 30 cm × 15 cm × 7.5 cm. In the southwest corner is a small posthole with a diameter of 20 cm. The eastern wall is 4.9 m long and 1.00 m wide with the surviving height of 24 cm. Three courses of brick are apparent from the outer side. The northern wall, which forms the southern margin of the passage (Structure No. 3H4), is 3.50 m long, 1.10 m wide, and has survived to a height of 14 cm. The western wall is 5.00 m long, 1.00 m broad and has survived to a height of 10 cm. The methods of construction used to build three of the walls is similar, but the northern wall was made using three rows of bricks, all placed vertically. The area enclosed by the structure is small, measuring only 2.90 m from north to south and 1.50 m from east to west. Since this structure is located on the periphery of the complex and near the western entry, it is strong, sturdy and thick. The small area enclosed could have been used for storage. The northern section of the western wall is partly destroyed due to two later pits that cut into it, one towards the northern end with a diameter 1.10 m and the other (20 cm to its south) with a diameter 70 cm. South of the southern wall of Structure No. 3Y is a small rectangular enclosed area, measuring 2 m from east to west and 60 cm from north to south. It is enclosed by a single line of vertically placed bricks. This feature is between Structure Nos. 3X and 3Y and could been used for planting flowers.

Structure No. 3Y1

To the west of Structure No. 3Y is a small passage that was enclosed at the northern end, possibly at a later date. It originally formed a passage to Structure No. 3W (Figure 5.106). It falls within the western half of 1D7 and the northeast corner of 1D8. The length from the enclosed wall to the entry of the Structure No. 3X, which forms the courtyard of Structure No. 3W, is 4.85 m. It is 1.60 m in width. To the east of the passage is the western wall of Structure No. 3Y, whereas to the west for a distance of 2.10 m is the eastern wall of Structure No. 3Z2. The wall, which closes the northern opening of this passage, is 1.60 m long and 60 cm wide and has survived to height of 17 cm. The wall was made primarily of mud-bricks, but towards its western end were three burnt bricks that suggest that it was constructed at a later date.

Structure No. 3Z

To the west of Structure No. 3W and south of Structure No. 3Z1 is structure Structure No. 3Z, which is rectangular in shape (Figure 5.107). It falls within Trench 1E8 and extends into the western half of Trench 1E7. Though all four walls have been



Figure 5.105 Details of Structure 3Y



Figure 5.106 Details of Structure 3Y1

excavated only the central section of the southern wall has survived, as both of the structure's ends have been cut by later pits. The southern wall was originally 4.80 m long and 55 cm wide but the surviving length measures only 1.40 m with a height of 22 cm. At the centre of this wall is a posthole with a diameter of 15 cm. The eastern wall is 3.65 m long and 70 cm wide with the surviving height of 15cm. The average size of the bricks is 30 × 15 × 7.5 cm. The northern wall is 4.30 m long and 63 cm wide with a remaining height of 12 cm and four postholes. The first is located to the western end of the wall and has diameter 30 cm, followed by the next which is 85 cm to the east of the first and has the same diameter. The third one is small, located along the outer margin of the wall, 35 cm to the east of the second posthole with a diameter of 15 cm. The fourth posthole is 1 m to the east of second and has a diameter of 25 cm. Out of these postholes, the first, second and fourth appear to be contemporary and associated to the structure, while the third may be from a later level. The western wall is 3.65 m long, 62 cm wide and has survived to a height of 20 cm. There are two small pits in the centre, which appear to belong to a later date. The area enclosed by this structure measures 3.50 m from east to west and 2.30 m from north to south. It has a rough and uneven floor and may have been used for non-dwelling activities.

Structure No. 3Z1

This structure (Figure 5.108) is located to the east of the passage (Structure No. 3Y1) and north of Structure No. 3Z. It falls in the northwest quadrant of 1E7, the northern half of 1E8, and the western edge of 1D7 and 1D8. The eastern wall, which was the western periphery of the passage (Structure No. 3Y1), has been completely destroyed by a large Early Historic pit and is preserved only in parts. The wall was originally 5.40 m long and 65 m wide. It has survived to a height of 10 cm. The northern wall of Structure No. 3Z forms its southern wall, and the western periphery of this structure was 5.35 m long. However, the western wall only extends for 2.90 m. There is a gap towards its northern end at 1.77 m, which may have been an entrance to the structure. This wall has been slightly damaged in the middle by a later pit that is 1.45 m to the north of the southern end. The entire floor within the structure has been damaged by a later pit. The contents of this structure have been lost and therefore its exact function cannot be determined. However, considering the large size of room near the entrance, it may have been a dwelling area for the occupants of the complex.

Structure No. 3Z2

This structure, located to the north of Structure No. 3Z1 and south of the passage (Structure No. 3Y1), is relatively well preserved and all the four of its walls were exposed (Figure 5.109). It falls within the southern half of Trench 1C8, the northern half of 1D8, and the northeast corner of 1D9. The southern wall of the structure is 4.75 m long and 70 cm wide. It has survived to a height of 15 cm. It has been partially destroyed in the middle along the southern margin by a later pit with diameter 1.30 m. Two postholes were identified near its western extremity; the first on the extreme west is 50 m to the east of the western periphery and has a diameter 26 cm. The other posthole, 15cm to the east of the first, has a diameter of 21 cm. The western wall is 4.00 m in length, 70 cm wide, and has survived to a height of 20 cm. Only two basal courses of bricks from the wall were identified. In the middle of the wall at a distance of 1.25 m to the north and the southern end is a small posthole with a diameter 17 cm. The northern wall, which is also the southern margin of the drainage and the small street, is 4.75 m long, 70 cm wide, and has survived to a height of 15 cm. The eastern wall, the southern part of which comprises the western margin of the passage (Structure No. 3Y1). The northern part is the western wall of Structure No. 3H4. It is 4.20 m long and 80 cm wide. It has survived to a height of 17 cm. Two



Figure 5.107 Details of Structure 3Z



Figure 5.108 Details of Structure 3Z1



Figure 5.109 Details of Structure 3Z2



Figure 5.110 Details of a fire pit in 3Z2

postholes on either side were found within this wall. The one near the northern side is 50 cm to the south of the northern end and has a diameter 25 cm. The other posthole near the southern side is 60 cm north of the extreme end of the wall and has a diameter 24 cm. Toward the middle of the interior of the structure, at a distance of 1.10 m to the south of the inner margin of the northern wall and along the inner face of eastern wall is a rectangular fireplace oriented east to west (Figure 5.110). It is 75 cm long, 60 cm wide, and has a depth of 10 cm. The sides and the bottom are burnt red, suggesting its lengthy use. This room, which has a slightly uneven and rough floor, was probably a kitchen. It enclosed a space measuring 2.70 m from north to south and 3.35 m from east to west.

Structure No. 3Z3

To the west of the Structure Nos. 3Z and 3Z1 is an open space that has been excavated over an area of 2.15 m from east to west and 4.80 m from north to south (Figure 5.111). It falls in the western half of Trench 1E8. To its east are the western walls of Structure Nos. 3Z and 3Z1. To its south is a broad mud-brick wall that was excavated to a length of 2.80 m. It has a width of 90 cm and has survived to a height of 7 cm. Along its inner margin at a distance of 1.45 m to the west of the eastern end is a posthole with diameter of 20 cm. To its north is a wall made of a single row of bricks that was excavated to a length of 80 cm. It is 20 cm wide with a surviving height of 4 cm and appears to have been an open space between Structure Complex Nos. 3 and 5.

Structure No. 3Z4

To the west of Structure No. 3Z2 is located Structure No. 3Z4 (Figure 5.112). It spans the southwest quadrant of 1D8 and 1D9, as well as the southeast corner of 1C9. All of its remaining three walls are well preserved and exposed, save for the southern margin. The western wall of Structure No. 3Z2 forms the eastern wall of the structure. Towards its southern end there is an opening of 1.77 m in the northern part of the western wall of Structure No. 3Z1. This opening is shared by Structure Nos. 3Z1 and 3Z4. The thin northern wall of Structure No. 3Z3 could be a part of the southern wall of this structure. The western wall was exposed to a length of 4.25 m, though the southern end of this wall has not been excavated. It is 40 cm broad and is made of a vertically placed row of bricks that measure 40 × 20 × 10 cm. Towards its northern end, at distance of 45 cm from its southern margin, is a circular posthole with diameter 17 cm. The northern wall is 3.80 m long and 1.20 m wide. It has survived to a height of 10 cm. It runs parallel to the drain on the small street on its northern side.

Inside the structure is a 1.45 m long partition wall, which is located 1.35 m to the south of the inner face of the northern wall of the structure (Figure 5.112). The total area inside structure measures 2.70 m from east to west and 4.80 m from north to south. This could be part of a dwlling room that was connected to Structure No. 3Z1.

Structure No. 3Z5

This structure lies at the westernmost limit of Structure Complex 3, located west of Structure No. 3Z4. It spans the western half of Trench 1D9 and the eastern half of 1D10. Only its northeast portion has been excavated, an area of 4.50 m from east to west and 3.35 m from north to south having been exposed (Figure 5.113). The western wall of Structure No. 3Z4 forms the eastern wall of this structure. The northern wall of Structure No. 3Z4 continues further west and forms northern wall of this structure, which was excavated to a length of 5.10 m. Its average width is 1.05 m and a number of postholes were identified in the wall. There are two postholes arranged in the north to south direction at a distance of 42 cm from the inner face of the eastern end of the northern wall. The one on the northern side has a diameter of 23 cm and the



Figure 5.111 Details of Structure 3Z3



Figure 5.112 Details of Structure 3Z4



Figure 5.113 Details of Structure 3Z5



Figure 5.114 Lane 3 between Structure Complex 3 and 6, Period IIB

one on the southern side has a diameter of 16 cm. At a distance of 20 cm west of the northern post hole is another small posthole with a diameter of 13 cm. To the west of the southern posthole, at distance of 72 cm, is another large posthole with a diameter of 30 cm. Along the northern face of northern wall, at a distance of 1.10 m from the exposed western end and 55 cm to its east are two small pits of a later date. The structure has a rough and uneven floor. Since a large area of this structure has not been excavated its exact function cannot be determined.

Functional Analysis of Structure Complex 3

This large complex seems to have been occupied by eight households belonging to an extended family. This identification is based on the location of different rooms within the complex, their sizes, shapes, floors, features, pottery and other artefacts inside or around the rooms.

The dwelling rooms within the complex usually have a large rectangular plan and well-made floors of alternating layers of alluvium soil and silt, rammed hard and plastered with clay and cow dung. These rooms are usual open and devoid of other features. Smaller rooms or antechambers with or without well-made floors that sometimes contain cylindrical pits have been identified as storage spaces. Rooms that contain fireplaces, storage, cooking, storage jars and fine pottery, lots of animal, fish and bird bones, etc., seems to have been used for cooking activities, thus they have been identified has kitchens.

Structure Complex No. 3 is too big to have been occupied by a single household. It is located in the centre of the settlement, well planned and perfectly built. It may have belonged to a socially and economically influential joint family. Considering the criterion mentioned above for the classification of structures (rooms), eight individual households with living areas, kitchens, and storage spaces could be identified within the excavated area of this complex. Household No. 1, located near the northeast part of the complex along Main Street, includes Structure Nos. 3D, 3E and 3I. Structure No. 3D, a rectangular chamber and Structure No. 3E, a small square room with a flimsy floor, are too small to be used for dwelling and were therefore identified as storage rooms. Structure No. 3I is large, contains a fireplace and three small rectangular pits (one of which could have been used for water storage), a mud-brick platform and mud-brick floor. It was probably the kitchen-cum-living room of Household No. 1.

Structure Nos. 3F and 3G located, to the west of Household No. 1 seem to form a second household (Household No. 2). Structure No. 3G, a small room containing a silo, was probably used for storage. Structure No. 3G, a large rectangular room containing an antechamber towards its northern end, L-shaped partition wall and two fireplaces, could be the living room-cum-kitchen of this household.

Structure Nos. 3A, 3B and 3C, located towards the northeastern edge of the excavated area, may form another independent household (Household No. 3). The kitchen of this household has not yet found as it probably lies towards the northern unexcavated portion. Structure No. 3A and 3C, small in size and containing silos, could be storage places. Structure No. 3B, which has only been partially excavated, could have been used for dwelling as it has a well-made floor.

Structure No. 3H, located towards the northwest part of the excavated area of the complex, may represent a separate household (Household No. 4). This large, hall-like room appears to have divided into different areas, which could have been used to perform different activities. Structure Nos. 3H1, 3H2, 3H3, 3H4, 3H5 could form part of this complex.

Similarly, Structure Nos. 3K, 3W, 3Y, 3X, 3Y1 (3W – the workshop, 3X – the veranda of ST 3W and 3Y storage) located to the west of the central courtyard (Structure No. 3J) may also represent a separate household (Household No. 5) within the complex. This also may have been divided into a number of parts by partition walls. It has a relatively well-made

floor, which is badly damaged at places by later disturbances, a fireplace, mud-brick platform and a small rectangular storage pit. Since it contains cooking and storage facilities and has a large area with a well-made floor, it qualifies as an independent household within the complex.

Structure Nos. 3M, 3N, 3O, 3P and 3Q may form another household (Household No. 6) as Structure Nos. 3M and 3N have cooking facilities and Structure No. 3O and 3P have storage facilities. Structure No. 3Q and part of Structure No. 3M, having a relatively large area and a slightly better floor, may have been used for dwelling. This household (Household No. 6) is located in the southeast part of the complex.

To the west of Household No. 6 is one more household (Household No. 7), which includes Structure Nos. 3R, 3S, 3T, 3U and 3V. Structure Nos. 3R, 3S, 3U and 3V are all very small in size, and could have been used as storage rooms. Structure No. 3T, divided by a partition wall and equipped with a fireplace, storage pits and mud-brick platform was probably the kitchen-cum-dwelling of the household.

Household No. 8 includes Structure No. 3Z2, which is a kitchen, Structure Nos. 3Z1, 3Z4, 3Z5, which were living rooms, Structure No. 3Z3 as an open space, and Structure No. 3Z as storage area.

The structures located on the periphery of this complex are parallel and symmetrical to either Main Street or Lane No. 1. The builders of Structure Complex No. 3, however, did not maintain this symmetry on its the inner side. Household Nos. 2, 4, 5, 7 and 8 were located on the margin of the central courtyard (Structure No. 3J). Each household may have had an entrance to the courtyard. Household Nos. 1 and 6 have a common space between them (Structure No. 3L), which probably marks one of the main entrances to the complex and opens towards Main Street.

Of all the households in Structure Complex No. 3, Household No. 1 appears to be special. Apart from the common entry on the southern side, it has an additional private entrance that opens onto Main Street through a small passage along the northern wall of Structure No. 3I. At the eastern end of this passage to Main Street are two flights of steps made of mud-bricks. The lowest step measures 1.15 m in length from north to south and 60 cm in from east to west, whereas the step above it is 85 cm from north to south and 20 cm from east to west. The passage inside is as wide as the upper step (85 cm), which runs straight for a distance of 3.90 m and then sharply turns to run along the western wall towards the south (Figure 5.100). As is evident at Harappa and Mohenjo-daro, Harappans rarely build passages or platforms that directly articulate with main streets. At two very important Harappan cities, now located in Pakistan, none of the houses open onto main streets. Entrances are instead placed opposite to main streets on much smaller lanes or gullies. There is a possible entrance to Household No. 7 through the southern wall of Structure No. 3S, as a section of the wall is considerably thin compared to the walls of the remaining structures located along Lane No. 1. Whether there are private entrances to the other households it is not yet clear, as part of the complex remains unexcavated and some architectural features may not have been preserved.

Lane No. 3

Between Structure Nos. 3Z2, 3Z4, 3Z5 of Structure Complex 3 and Structure Nos. 6E and 6F of Structure Complex 6 lies Lane No. 3, which separates these complexes from one another. This lane falls in the southern half of 1C9, the southeast corner of 1C10 and 1D9, the northwest corner of 1D10, and the northern half of 1D11. The lane is 1.60 m wide and is oriented from northeast to southwest. It has been exposed to a length of 20 m from the western end of the veranda of Structure No. 3H3 (Figure 5.114). Along its southern margin, parallel to the northern walls of Structure No. 3Z2, 3Z4 and 3Z5 is a 40 cm wide drain that was exposed to a length of 19.40 m. The drain is lined on its southern periphery by a burnt brick wall, 2 courses of which have survived. The burnt brick

wall was exposed for a length of 14.50 m. The drain is made of wedge shaped burnt bricks that measure 30 cm in length, 15 cm in width at the broad end, and 12 cm in width at the narrow end. Each is 9 cm high, ant they were arranged so that they alternate. 105 bricks are visible over a length of 14.50 m, and it is likely that a similar arrangement formed the other wall of the drain. Since the drain is located in the lane, it is quite likely that it was closed. Inside the drain was a high concentration of potshers and bones, including complete and fragmentary long bones.

Lane No. 1

To the south of Structure Complex No. 3 and north of Structure Complex No. 4 is a narrow rectangular strip devoid of any buildings (Figure 5.115). The team believes that this feature is lane running in between these two structural complexes. The lane runs in the southeast-northwest direction and its average width is 1.20 m, approximately one-third of the width of Main Street. It runs from the outer side of the northeastern corner of Structure No. 4B, straight west for a length of 18.80 m, and then turns at a right angle towards the south at the northwestern corner of Structure No. 4F for a distance of 5 m, where it becomes slightly broader (1.45 m). The lane then turns west at a right angle. This last segment has been exposed to a length of 4 m. It continues into the unexcavated portion of the site (Figure 5.115). Toward the east, Lane No. 1 ends in an open space at an intersection with Main Street. It runs along the southern walls of Structure No. 3N and Structure No. 3Q until it comes to the southeastern corner of Structure No. 3N.

Structure Complex No. 4

(Figure 5.99 - 5.105)

To the south of Lane No. 1 another structure complex made of mud-bricks, which has been partially exposed. It is contemporary to Lane No. 1, Main Street and Structure Complex Nos. 2 and 3. Lane No. 1 borders the northern and western sides of the complex. Nine rooms from this complex have been given structure labels with alphabetical suffixes. These begin with Structure No. 4A and conclude with Structure No. 4I. It is clear that the complex expands further east and the south into unexcavated portions of the site. This structure complex is oriented in the northwest-southeast direction, bringing it in line with Lane No. 1, Main Street, and Structure Complex Nos. 2 and 3. (Figure 5.116). The following are descriptions of the rooms excavated from this complex.

Structure No. 4A

This is a small rectangular structure attached to the outer edge of the eastern wall of Structure No. 4B near its southeastern corner. It juts into the open space or square formed by the intersection of Main Street and Lane No. 1. The area enclosed by this structure measures 1.70 m from north to south and 1.35 m from east to west. The southern portion of the eastern wall of Structure No. 4B forms the western wall of this structure, which is 2.60 m long from north to south and 55 cm wide. The northern wall made of a single line of vertically arranged bricks. It is 2.20 m long and 30 cm wide. The eastern wall is 2.60 m long and is also made of a single line of vertically arranged bricks. It is 30 cm wide. The southern wall is 2.10 m long and 40 cm wide. All of the walls have survived to a maximum height of 35 cm. Inside the structure is a flimsy floor which was overlain with debris from fallen walls. This structure is outside the complex may be independent, as it juts into the square formed by the intersection of Main Street and Lane No. 1, is very small in size, and devoid of any features. It may have been shelter for security guard (Figure 5.117).

Structure No. 4B

This structure is located on the eastern side of the entrance to Lane No. 1, west of Structure No. 4A. It



Figure 5.115 Lane no. 1 between Structure Complex nos. 3 and 4, from southwest



Figure 5.116 General view of Structure Complex no. 4, from northeast

is rectangular in shape, enclosing an area of 4 m from north to south and 2.55 m from east to west. All four walls have survived. The eastern wall, which is 4.45 m long and 50 cm wide, has survived to a height of 20 cm. Three courses of brick are apparent. Toward its northern side, 1.10 m to the south of the northern end, the wall has been damaged by a later circular pit, which has a diameter of 1.10 m. The northern wall running parallel to Lane No. 1 is 3.60 m long and 60 cm wide. It has survived to a height of 20 cm. The eastern side of this wall was also partly damaged by a circular pit, 90 cm in diameter, 1 m from the end of the wall. The southern wall of the structure, 3.60 m long and 80 cm broad, has survived to a height of 25 cm. The western wall of the structure, 5.30 m in length and 55 cm in width, was damaged by a later circular pit with a diameter of 1.10 m. The pit was located 1.50 m to the north of the southern end of the wall (Figure 5.117). This structure is also devoid of any other features and has flimsy floor, neither well made nor plastered. This was probably a storage room for the complex.

Structure No. 4C (Lane No. 2)

Structure No. 4C is not actually a structure but a possible passage into Structure Complex No. 4. Part of this passage runs between the western wall of Structure No. 4B and the eastern wall of Structure No. 4D. This narrow passage runs roughly north-south between two walls for a length of 5.20 m and then takes a 90° angle, turning towards the west. At a distance of 3 m from the edge of the western wall of Structure No. 4B, the same wall turns again towards the south and runs straight. 70 cm of its southern segment have been exposed. The passage continues south into an unexcavated portion. The average width of the segment of the passage the runs between the western wall of Structure No. 4B and the eastern wall of Structure No. 4D is 1.65 m, whereas between southern wall of Structure No. 4D and northern wall of Structure No. 4I it narrows to 1.35 m. When it turns towards the southern side, it again becomes 1.65 m in width. This surface of the passage is hard due to its constant use (Figure 5.100).

Structure No. 4D

To the west of Lane No. 2 (Structure No. 4C) is a small rectangular room, which encloses an area of 3.30 m from north to south and 2.30 m from east to west. All four of its walls are well preserved. The eastern wall, which forms the western margin of Lane No. 2 (Structure No. 4C) is 4.65 m long and 55 cm wide. At a later stage a single line of mud-bricks was added to the inner edge of this wall. It is 15 cm in width. The total width of the wall thus becomes 70 cm. The northern wall of the structure, which is located on the southern margin of Lane No. 1, is 3.50 m long 65 cm wide. It has survived to a height of 18 cm. The western wall, which is also the eastern wall of Structure No. 4E, is 4.70 m long and 70 cm wide. It has survived to a height of 17 cm. The southern wall of the structure, 3.45 m long and 65 cm wide, is located on the margin of Lane No. 2 (Structure No. 4C) and has survived to a height of 15 cm. Inside the structure is the base of a later circular pit that is 65 cm south of the northern wall and 60 cm west of the eastern wall. It has a diameter of 75 cm and has survived to a depth of 5 cm (Figure 5.100). The structure has a very well-made floor, rammed hard and plastered, and could have been one of the dwelling spaces of the complex.

Structure No. 4E

To the west of Structure No. 4D is a large hall-like structure. The total dimensions of the area excavated inside the structure measure 6.70 from north to south and 5.70 m from east to west. The western wall of Structure No. 4D forms part of the eastern wall of this structure. It has been excavated to a length of 6 m and is made of a single line of vertically arranged mud-bricks. The average width of the wall is 30 cm and it has survived to a height of 15 cm. The northern wall, 6.60 m long and 55 cm wide, runs parallel to Lane No.



Figure 5.117 St. nos. 4A, 4B, 4C (Lane 2), 4D and 4I, from southeast



Figure 5.118 St. nos. 4E and 4F, from southwest

1 and has survived to the height of 16 cm. The western wall, which forms the eastern wall of Structure No. 4F, has been exposed to a length of 6 m. Its average width is 65 cm and has survived to a height of 15 cm. A very small portion of a square mud-brick platform, surviving to a height of 15 cm, has been excavated in the northeastern corner, which was probably used as a sitting platform. Inside the structure, two thin walls run parallel to one another. They are made of a single line of mud-bricks one above the other run in the east-west direction. Both originate from the inner face of the eastern wall. Both are 30 cm wide. One is 3 m to the south of the northeastern corner of the structure. It is 2.90 m long and 15 cm wide and has survived to a height of 15 cm. At the western end of this wall was added a wall that runs from north to south. It has the same thickness towards its southern side, which has now survived for a length of only 30 cm. At a distance of 90 cm to the south of the wall running from east to west is another small partition wall, which has survived to a length of 1.45 m. These walls form a small rectangular chamber, which could have provided protection to a possible fireplace, indicated by burnt patches within the chamber. Inside the structure was a well-made floor, which has survived near the northeast and southwest corners of the structure. The remaining major portion of the floor has been disturbed by later pits (Figure 5.118). This structure was probably used for kitchen-cum-dwelling activities.

In the southeast corner of this hall-like structure is a small antechamber. This antechamber is 1.50 m broad and was exposed to length of 3.90 m. It continues into the unexcavated area. The eastern wall of structure continues south and forms the eastern wall of the antechamber. But it is thin (35 cm) compared to wall on northern side, which is 70 cm broad. This wall survived to thickness of 20 cm, but was damaged at its southern end. The northern wall of the antechamber is 1.98 m long, 30 cm wide and survived to thickness of 20 cm. The western wall was excavated to a length of 3.65 m. It has been destroyed in the middle by a large early historic pit located 1.75 m to the south of the northern end. The pit has a diameter of 1.65 m. As the pit has destroyed the surface and floor of this antechamber it is difficult to identify its exact function.

Structure No. 4F

This structure is located in the northwestern corner of the complex (Figure 5.118). It is encircled on its northern and western sides by Lane No. 1 and shares a common wall with Structure No. 4E on its eastern side. All four of its walls have been well preserved. A length of 3.65 m of the western wall of Structure No. 4E forms the eastern wall of this structure. The northern wall, which runs parallel to Lane No. 1 on the northern side, is 4.65 m long and 65 cm wide and has survived to height of 20 cm. It has survived to a thickness of 10 cm near its western end for a length of 1.55 m. The western wall is 3.50 m long and 70 cm wide, and parallel to Lane No. 1 in the north-south direction. It has survived to a height of 10 cm. Towards its southern end, it has survived to a height of 15 cm. The southern wall of this structure is 4.70 m long and 65 cm wide. It has survived to a thickness of 20 cm. The area enclosed by this structure measures 3.35 m from east to west and 2.25 m from north to south. It has a well-made floor, rammed hard and plastered, probably served as another swelling place for this complex.

There is a platform attached to the outside of the southern wall of this structure. It is made of brick pavement. It is exposed in an area that measures 2.60 m from north to south and 4.70 m from east to west. It continues south into the unexcavated area. Two large pits, one located along its western edge and the other in its centre, have damaged the platform considerably. This may have been the southern courtyard of Structure Complex No. 4. A rectangular fireplace, survived by its base, does not belong to the structure. It runs along the southern edge of the southern wall, 1.35 m to the east of the western end of the wall. It measures 70 cm by 40 cm. A small circular posthole,

which has a diameter of 15 cm, is located near the southeast corner in the wall.

Structure No. 4G

To the southern margin of the intersection of Main Street and Lane No. 1 is a rectangular structure oriented from east to west (Figures 5.120, 5.121 and 5.124). Its northern wall, 6.35 m long and 60 cm wide, rns parallel to the square formed by the intersection. It has survived to a height of 15 cm. This wall extends towards the east and forms the northern wall of an unexcavated structure to its east. As only the northwestern corner of that structure has been excavated, it has not been assigned a number. The western wall was partly excavated to length of 2.40 m. Its average width is 45 cm. The exact length of the wall cannot be measured, as the southern portion extends beyond the excavated area. It has survived to a height of 20 cm. The eastern wall is 3.80 m long and 35 cm wide. It has survived to a height of 15 cm. From the southeastern corner, the southern wall runs west for a length of 3.45 m and then takes a right angle turn towards the south. This extension has not been excavated (Figure 5.120).

The structure, which has a well-made rammed floor, contains four features. Two are located along the inner edge of the eastern wall. One of them is a large Red ware storage jar with a pointed flat base placed in a pit. It is 50 cm to the south of the northeastern corner. The upper half of the vessel has been cut away. At a distance of 15 cm to its south is a rectangular fireplace running along the eastern wall. It is 1 m long from north to south, 55 cm wide from east to west, and 15 cm deep. The sides and bottom of the fireplace, which were lined with clay, are burnt red due to constant and long use (Figure 5.121). Both of these features are located on a mud-brick platform that is 90 cm broad adjoins the entire length of the eastern wall. It is 2.40 m long.

In the northwestern corner of this structure is a small rectangular pit lined with bricks. It is located 60 cm to the east of the western wall along the inner face of the northern wall. It covers an area of 80 cm from north to south and 50 cm from east to west. It is 20 cm deep. The eastern, western and southern sides of this pit are lined with a single line of bricks. The bricks are placed horizontally along the eastern and western sides, whereas they are arranged vertically along the southern side of the fireplace (Figure 5.119). The total area enclosed by this pit, including its walls, measures 85 cm from east to west and 1.20 m from north to south. It could have been a water storage pit as it was plastered with clay on the inner side.

A small circular pit 30 cm in diameter was found to the east of the rectangular brick-lined pit at a distance of 30 cm. It is 10 cm deep and could be a depression used to accommodate a round-based pot. This structure has a well-made floor that was rammed hard and plastered.

This structure has been identified as a kitchen based on the cooking and storage features it contains.

Structure No. 4H

This structure, located to the east of Structure No. 4I, encloses an area of 3.90 m from north to south and 2.30 m from east to west. The length of its eastern wall is 5.20 m, and its western wall is 5.20 m length. Its southern wall is 2.75 m long and 90 cm wide. It survives to a depth of 15 cm. The western wall of Structure No. 4G forms the eastern wall of this structure. The western wall, which was excavated to a length of 1.10 m, is 45 m wide and has survived to a height of 15 cm. The northern wall is 3.63 m long and 55 cm wide (Figure 5.104 and 5.125). It has survived to a height of 20 cm. It has a well-made floor, but at this stage the exact function of this structure cannot be identified since a major portion of it has not been excavated.

Structure No. 4I

To the west of Structure No. 4H is another structure, roughly square on plan. The area enclosed by this structure is 2.20 m from north to south and 2.60



Figure 5.119 Rectangular brick-lined pit in St. no. 4G, from southeast



Figure 5.120 St. nos. 4G, 4H and 4I, from southwest



Figure 5.121 Storage jar and a fireplace in St. no. 4G, from southeast



Figure 5.122 Structure Complex 4 located to the south of Lane 3, Structural Phase II, Period IIB



Figure 5.123 Details of a part of Lane 2 and Structure 4I to its east



Figure 5.124 Details of Structure 4G



Figure 5.125 Details of Structure 4H

m from east to west. The southern wall is 3.40 m long with an average width of 40 cm. It has survived to thickness of 6 cm. The eastern wall is 3.40 m long and has an average width of 74 cm. the western wall is 3.30 m long and its average width is 30 cm. It has survived to thickness of 20 cm. Part of SW corner has been destroyed by a later pit, which has diameter 1.20 m.

To its south is another room which was excavated but has not been assigned a number. It was exposed for an area of 2.40 m from east to west and 1.80 m from north to south. The southern wall of Structure No. 4I forms its northern wall. The eastern wall of Structure No. 4I froms eastern wall of this unnumbered structure. Both structures have well made floors and it is quite likely that they were used for dwelling.

The southern wall of Lane No. 2 (Structure No. 4C) forms the northern wall of this structure. It is 1.10 m further toward the northern side than the northern walls of Structure Nos. 4G and 4H, (Figure 5.120) and as such its function cannot be determined. Major portions of this structure underlie the unexcavated area to the south.

Functional Analysis of Structure Complex No. 4

A number of households could be identified within this complex based on room locations and contents. Structure Nos. 4A and 4B, located on the eastern side of Lane No. 2, could be freestanding stalls for the security personnel. They are close to the open square that divides the settlement into a number of smaller units. The main passage to the structure complex probably consists of Lane No. 2, which passes through its centre. At a later point in time Lane No. 2 was closed by a mud-brick wall that capped its northern end, which had previously intersected with Lane No. 1. Structure Nos. 4D, 4E and 4F may have formed a single household within the complex, as it includes cooking and storage facilities along with a dwelling area. Structure Nos. 4G, 4H, and 4I, which

are located to the south of Structure Nos. 4A and 4B, appear to form a separate household.

Structure Complex No. 4 appears to have been smaller than Structure Complex No. 3. As the complex is located towards the southern periphery of Locality 1 and is relatively small in size, the team suspects that the occupant may not have held as high a social status.

So far, no evidence of craft manufacturing has been found in any of the excavated structure complexes at Farmana. This part of the site (Locality 1) may have been a citadel, which may explain the fabulous state of the architecture in the area. The structures were arranged in a proper grid and made from very fine-quality brickwork. Additionally, these structure complexes were well furnished and contained a variety of objects, including steatite seals and a terracotta sealing. Craft manufacturing may have been carried out in Localities 2 and 3, as those parts of the settlement appear to be part of the lower town. As the site was under cultivation and all the structures were made of mud or mud-bricks, features such as a fortification wall have not survived. Future work will shed more light on these possibilities.

Structure Complex No. 5

(Figures 5.126 - 5.132)

To the west of Lane No. 1, which was excavated last year, and southeast of Structure Complex 3 is Structure Complex 5 (Figure 5.126). It is also a multi-room complex, 8 rooms of which have been excavated. The complex extends further into the unexcavated western and southern areas of the site.

Structure No. 5A

On the western side of the lane, where it turns south, is Structure No. 5A. This structure falls in the northeast, southeast, and southwest quadrant of Trench 1G7, the northwest quadrant of 1H6, and the northern half of 1H7. It is square in shape but has a small rectangular extension towards its northeast corner that measures 2.35 m from east to west and 1.50 m from north to south (Figure 5.127). It has a small northern wall, which is 2.30 m in length and 48 cm in width. It has survived to a height of 13 cm. The eastern wall is 2 m in length, 80 cm in width and has survived to a height of 18 cm. It is open towards its southern side. For a length of 1.90 m, the southern part of the eastern wall of Structure No. 5C forms the western wall of this extension. This extension is 60 cm broad and has survived to a height of 21 cm.

The main structure, which measures 3.80 m from east to west and 4.20 m from north to south, is well preserved and was completely exposed. The eastern wall, which runs parallel to the north to south bend of Lane No. 1, is 4.80 m in length and 72 cm in width. It has survived to a height of 21 cm. The southern wall is 5.15 m long, 60 cm wide and has survived to a depth of 18 cm. The western wall of the structure is 5.35 m in length, 72 cm in width has survived to a height of 18 cm. The southern length of wall (3.50 m) is part of the eastern wall of Structure No. 5B. For a length of 1.30 m, the northern portion of the western wall was built separately and therefore is different in construction from the remaining wall. It is also narrow (63 cm) compared to rest of the walls. In the northwestern corner is a small square platform measuring 55 cm from east to west and 68 cm from north to south. It has survived to a height of 14 cm.

The structure has a rough and uneven floor, which may be the result of its proximity to the ploughing zone. The occupants of the complex may have used it as a dwelling area.

Structure No. 5B

To the west of Structure No. 5A lies a small well-preserved room, the southern part of which is still unexcavated. It was found in the northern half of Trench 1H7, the northeast quadrant of 1H8, and the southwest quadrant of 1G7. Its excavated area measures 1.85



Figure 5.126 Structure Complex 5 to the west, Structural Phase II, Period IIB



Figure 5.127 Details of Structure 5A

m from north to soutn and 2.25 m from east to west. Its northern wall is fully excavated but the eastern and western walls are only partially exposed. The southern wall is completely unexposed (Figure 5.128). A large part of the southern section of the western wall of Structure No. 5A forms the eastern wall of this structure. The northern wall is 3.75 m in length, 70 cm in width, and has survived to a height of 14 cm. The western wall, which is 70 cm wide, has been exposed for a length of 1.90 m. It has survived to a height of 15 cm. The average sizes of the bricks used for construction is 30 × 15 × 7.5 cm and 32 × 16 × 8 cm. This small structure with a well made floor could have been used as a storage area.

Structure No. 5C

This well preserved square structure in the centre of the complex is located to the north of Structure Nos. 5A and 5B (Figure 5.129). It was found in the southern half of Trench 1F7 and the northwest, northeast, and southwest quadrants of 1G7. All four walls are very well preserved. The southern wall forms part of Structure No. 5A and part of an L-shaped structure (Structure No. 5D). It is 4.10 m long, 60 cm wide and has survived to a height of 24 cm. The eastern wall of this structure is 4.20 m long, 50 cm wide and has survived to a height of 22 cm. The northern wall is 4.10 m long, 60 cm wide and has survived to a height of 20 cm. Towards its eastern extremity, 55 cm to the west of the eastern end, is a small posthole with a diameter 14 cm. Towards its eastern end, along the outer margin the wall, is some slight damage caused by the cutting of a later pit. The western wall of the structure is thin (52 cm). Compared to the other three walls, it is 4.20 m long and has survived to a height of 20 cm. Inside the structure is a thin partition wall made of a single row of vertically placed bricks that is 32 cm broad. This wall is located 1 m to the north of the southern wall and is oriented in the east to west direction, dividing the structure into two parts. The southern compartment is 1 m from north to south and 3.00 m from east to west. It has a well-made floor and appears to be part of a dwelling area for the complex. The bricks used for constructing the walls are 32 × 16 × 8 cm.

Structure No. 5D

To the west and southwest of Structure No. 5C is Structure No. 5D. It falls within the eastern half of Trench 1G8, the southwest quadrant of 1G7, and the northeast corner of 1H8. It is an L-shaped structure, the longer axis of which lies in the north to south direction and smaller axis lies in the east to west direction. The smaller axis is separated by a small partition wall, which has survived to length of 90 cm and is made of single row of horizontally arranged bricks that measure 32 × 16 × 8 cm. The area covered by the smaller axis measures 2.80 m from east to west by 1.30 m from north to south. The northern part of western wall of Structure No. 5A forms the eastern wall of the structure. The northern wall of Structure No. 5B forms southern wall of this structure, and the western wall is shared by both the longer as well as smaller parts of the structure, measuring 4.90 m in length and 40 cm in width. It has survived to a height of 14 cm. The total area of the longer axis measures 3.60 m from north to south and 1.60 m from east to west. This structure, which is sandwiched between Structure Nos. 5C and 5E, can be identified as a common area for the complex.

Structure No. 5E

To the west of Structure Nos. 5D and 5B is Structure No. 5E. It falls within the southern half of Trench 1G8 and the northern half of 1H8. It is probably a kitchen, as it contains a fireplace with an adjacent storage jar (Figure 5.130). The northern part (1.80 m) of the western wall of 5B and the entire western wall of Structure No. 5D forms the eastern wall of this structure. The northern wall is exposed to a length of 3.05 m and is 70 cm in width, surviving to a height of 18 cm. In all, three postholes are located in this wall;



Figure 5.128 Details of Structure 5B in the foreground and Structure 5D to its north in the background



Figure 5.129 Details of Structure 5C



Figure 5.130 Details of Structure 5E



Figure 5.131 Details of Structure 5F

two in a north to south line at the eastern end. The one on the north has a diameter of 20 cm and the other, which lies 20 cm to its south, has a diameter of 15 cm. The third posthole, which is 1.80 m to the west of the second posthole along the eastern end of the wall, has a diameter of 15 cm. The southern and western walls of this structure have not been excavated. The total area excavated measures 3.50 m from east to west and 5 m from north to south.

Along the inner margin of eastern wall at a distance of 2.05 m is a rectangular fireplace. Its longer axis (70 cm) abuts the wall and is 40 cm wide (see Figure 5.130). Due to its proximity to the ploughing zone, it has been almost completely destroyed. Immediately to its north was a small globular storage jar of fine red ware. It has a round base, though only on third of its lower body has survived. This pot was probably used to store water. Considering the rough finish of the floor and presence of fireplace, this structure was probably used as a kitchen.

Structure No. 5F

This structure is located to the north of Structure No. 5E (Figure 5.131). It falls within the northwest, southwest, and northeast quadrants of Trench 1G8 and along the southern edge of 1F8. Its western portion has yet to be excavated. Its eastern margin is well defined but the northern and southern margins have only been partially excavated. The eastern wall is 3.30 m long, with an average width of 55 cm. It has survived to a height of 18 cm. Along its eastern margin it has been damaged by a later pit with a diameter of 1.75 m. The northern wall of Structure No. 5E forms the southern wall of Structure No. 5F. The northern wall was exposed to a length of 2.40 m, is 60 cm wide, and has survived to a height of 14 cm. The area enclosed within measures 2.55 m from east to west and 2.30 m from north to south. It has very rough and uneven floor and probably served as a storage place.

Structure No. 5G

Immediately to the north of Structure No. 5F is Structure No. 5G, which is actually a mud-brick platform (Figure 5.132). It is located in the western half of Trench 1F8. A major portion of the centre of this platform has been destroyed by a later pit with a diameter of 2.30 m. The western part of the platform has yet to be excavated but the total area exposed measures 3.30 m from north to south and 2.10 m from east to west. The exact function of this pit is difficult understand as most of it is either damaged or unexcavated.

Structure No. 5H

To the north of Structure Nos. 5C and 5D is Structure No. 5H, which is in a very bad state of preservation because of later disturbances. It spans Trench 1F8 as well as the southwest quadrant of 1F7. It is rectangular in shape and measures 3.40 m from east to west and 3.20 m from north to south (Figure 5.133) The northern walls of Structure No. 5C and 5D form the southern wall of the structure. It is 4 m in length with an average width of 60 cm and has survived to a height of 15 cm. Its western wall, save for length of 90 cm towards its northern end, has been completely destroyed by a later pit. Its width cannot be measured. The northern wall has survived to a length of 1 m towards its western periphery while the remaining wall has been destroyed. Since its floor is completely destroyed, its exact function cannot be determined. In front of this structure, towards its eastern side is a rectangular open space measuring 2.70 m from east to west and 5.50 m from north to south.

Only one household from this complex has been excavated. Structure Nos. 5A, 5C and probably 5H are probably the dwelling areas for the complex. Structure No. 5G can was probably used as a working platform. Structure Nos. 5B and 5F could have been used for storage whereas Structure No. 5D was probably the open courtyard/space within the complex. Structure No. 5E served as a kitchen for the complex.



Figure 5.132 Details of Structure 5G



Figure 5.133 Details of Structure 5H in the centre

Structure Complex 6

(Figures 5.134 - 5.137)

This structure complex is located north of Lane No. 3 and west of Structure Complex 3. It also extends towards the north. In all, six rooms of this complex have been excavated. It appears that it extends further north and west. The entire complex is made of mud-bricks. is oriented 25° in the northwest to southeast direction, which is in alignment with other complexes excavated at site.

Structure No. 6A

To the north of Structure No. 6C in the north-west corner of Trench 1A9 is a small portion of this structure, which has been excavated over an area of 2.10 m from east to west and 80 cm from north to south (Figure 5.134).

Structure No. 6B

This structure is located in the eastern half of Trench 1A9 to east of Structure No. 6C (Figure 5.134). Its western wall and parts of its northern wall have been excavated whereas the remaining portion of the structure underlies the unexcavated portion of the site. The western wall has been excavated to a length of 5.10 m. It is 70 cm wide and has survived to a height of 7 cm. Sections of the southern part of the wall have been destroyed by a large, circular, Early Historic pit, which has a diameter of 1.40 m. This pit is located 1.10 m to the north of the southern excavated area. The northern wall is excavated to a length of 2.10 m. It is 60 cm wide and has survived to a height of 7 cm. The inner excavated area measures 1.90 m from east to west and 2.10 m from north to south. As a major portion of this structure is unexcavated, its exact function cannot be determined.

Structure No. 6C

To the west of Structure No. 6B and south of Structure No. 6A is Structure No. 6C, which appears to be square on plan. It is located in Trench 1A9 (Figure 5.134). The western wall of Structure No. 6B forms the eastern wall of this structure. The northern wall has been excavated to a length of 2.65 m and continues west into the unexcavated portion of the site. It is 65 cm wide and has survived to a maximum height of 5 cm. The southern wall, which has survived only to a length of 1 m, is destroyed towards its western side by a later pit. The western wall has not yet been exposed. The area exposed within the structure measures 2.95 m from north to south and 2.95 m from east to west. It has a well-made floor that has been disturbed at places. The occupants of this complex probably used this structure as a dwelling area.

Structure No. 6D

To the south of Structure No. 6C lies Structure No. 6D, the western periphery of which has not been excavated (Figure 5.135). This structure falls within Trench 1B9. The southern wall of Structure No. 6C forms the northern wall of this structure. The eastern wall is damaged in the centre but is 4.60 m long, 62 cm wide and has survived to a height of 16 cm towards its southern end. The southern wall is 5.40 m long with an average width of 70 cm, and has survived to a height of 13 cm. The average size of bricks used to build this structure 32 × 16 × 8 cm. Two large postholes were found in this wall, one at the eastern extremity with a diameter of 36 cm and the other, located 1.20 m west of the first, with a diameter of 30 cm. In addition, there are a number of later pits of different sizes, all of whch have caused considerable damage to this wall. The area excavated measures 3.40 m from north to south and 4.80 m from east to west. Since later pits have caused considerable damage to the floor, it is difficult to identify the function of this structure.

Structure No. 6E

To the south of Structure No. 6D and west of the bathroom of this complex is a small square room.



Figure 5.134 Structures 6A in the northeast corner, 6B in the foreground and 6C in the background, Structural Phase II, Period IIB



Figure 5.135 Details of Structure 6D in the foreground



Figure 5.136 Details of Structure 6E



Figure 5.137 Details of Structure 6F



Figure 5.138 Bathing place in Structure Complex 6

Structure No. 6E falls in Trench 1C9 and the southeast quadrant of 1B9. All four walls of this room have been excavated (Figure 5.136). For a length of 3.75 m, the western section of the southern wall of Structure No. 6D forms the northern wall of this structure. The eastern wall is 3.80 m long and 36 cm in width and has survived to height of 11 cm. The southern wall, which runs parallel to Lane No. 3, is 3.70 m long and 80 cm wide, surviving to maximum height of 18 cm. The western wall is 3.75 m long, 65 cm wide and has survived to a height of 9 cm. Within the southwest corner of this structure is a posthole with a diameter of 22 cm. It has a well made clay floor that has been damaged by four later pits. This could be identified as a dressing room as it is small size and close to the bathroom.

Structure No. 6F

To the west of Structure No. 6E is Structure No. 6F, which has been only partially excavated. It was found in the eastern half of Trench 1C10. Its northern and western walls have yet to be exposed (Figure 5.137). It is bigger in size than Structure No. 6E. The western wall of Structure No. 6E forms part of the eastern wall of this structure, while the southern wall that runs parallel to the lane and is an extension of the southern wall of Structure No. 6E is 4.30 m long, 76 cm wide and has survived to a height of 20 cm. The structure has a well made floor, which has been rammed hard and plastered. It covers an area of 3.30 m from north to south and 3.50 m from east to west. On this basis it has been identified as a dwelling area.

Bathing area of the Complex

To the extreme eastern end of the complex is a bathroom (Figure 5.138). It is to the east of Structure No. 6E, which shares its eastern wall with the bathroom. It is located in a square structure measuring 3.92 m from north to south and 2.95 m from east to west. The southern wall of this structure is 3 m long, 82 cm

wide, and has survived to a height of 15 cm, while the eastern wall is 3.90 m long with an average width of 62 cm. It has survived to a height of 11 cm and forms the eastern part of the southern wall of Structure No. 6D. In the centre at a distance of 1.50 m from the eastern end is a small water channel that measures 8 cm wide, lined on both sides with wedge-shaped burnt bricks. Two were placed on each side in the north to south direction.

Inside this room is a square-bathing platform made of rectangular burnt bricks (see Figure 93). It measures 2 m from east to west and 1.80 m from north to south. It has a raised periphery made of two courses of burnt bricks of that measure 32 × 16 × 8 cm. It has survived only in the western periphery. The southeast corner of the structure and the southeast corner of the burnt brick platform have been partially damaged due to later pits. The bricks of the platform are arranged in such a way that they rise towards the eastern and western periphery, forming a small channel at the centre for removing dirty water, which flows down towards its northern side and exitsf the room through the small water channel provided in the northern wall. Between the northern wall of the room and northern periphery of the platform there is a gap of 70 cm. This portion was made waterproof by lining it with mud-bricks and plastering its top. The southern wall of this structure is parallel to the drainage channel and Lane No. 3. As the water outlet of the bathroom is on the northern side, it could have been attached to another drainage channel located to the north, which is yet to be discovered.

The kitchen of this complex probably underlies the west or northwest part of the unexcavated portion of the site.

4 POTTERY KILN

Roughly 70 m to the south west of Locality 1, a pottery kiln was accidentally discovered that appears to have been used to fire earthen vessels (Figures 5.139 - 5.140). It was located in the field belonging to Baljit Singh of the village Badi Bhaini. This kiln was accidentally identified when the farmer cut part of a ditch between two of his fields for irrigation. It was found at a depth of 2.20 m from the Datum point of the site. It is a pear-shaped kiln oriented 100 in the northwest to southeast direction. It is made of clay within a pit and was found *in situ*. The pointed portion of the kiln points towards south while the oval/circular portion points towards north. It is 2.10 m long on the inner edge and the circular portion has a diameter of 1.35 m, whereas the narrow chamber is 50 cm wide. The kiln is made of clay and has been plastered on the inner side with fine silt. The average thickness of the wall of the kiln is 10 cm and has survived to a maximum height of 95 cm towards its northwest side. The remaining parts have survived to an average height of 60 cm. It has a flat bottom that was burnt red due to constant use. Similarly, the sides also have turned red because of it was used for a very long period of time. The plaster within the kiln has a also partially turned into vitrified clay. Inside the circular portion of the kiln was found a large brick (40 × 20 × 10 cm) lying flat on the base of the kiln. It was found 25 cm to the south of the northern end and 45 cm west of the eastern periphery. The brick inside was oriented parallel to the kiln (100 in the northwest to southeast direction).

This feature has been identified as a pottery kiln based on similar evidence from other Harappan sites. However, the kiln did not contain any pots *in situ*, as it was probably abandoned before it was covered with habitation debris. Inside the kiln were found a large number of burnt fragments from the wall of the kiln and potsherds belonging to the Mature Harappan Period. This kiln can therefore be attributed to the Mature Harappan Period at the site. The pots to be fired were probably placed in the circular portion of the kiln, and the large brick inside may have been used to support the pots. The pointed southern end could be

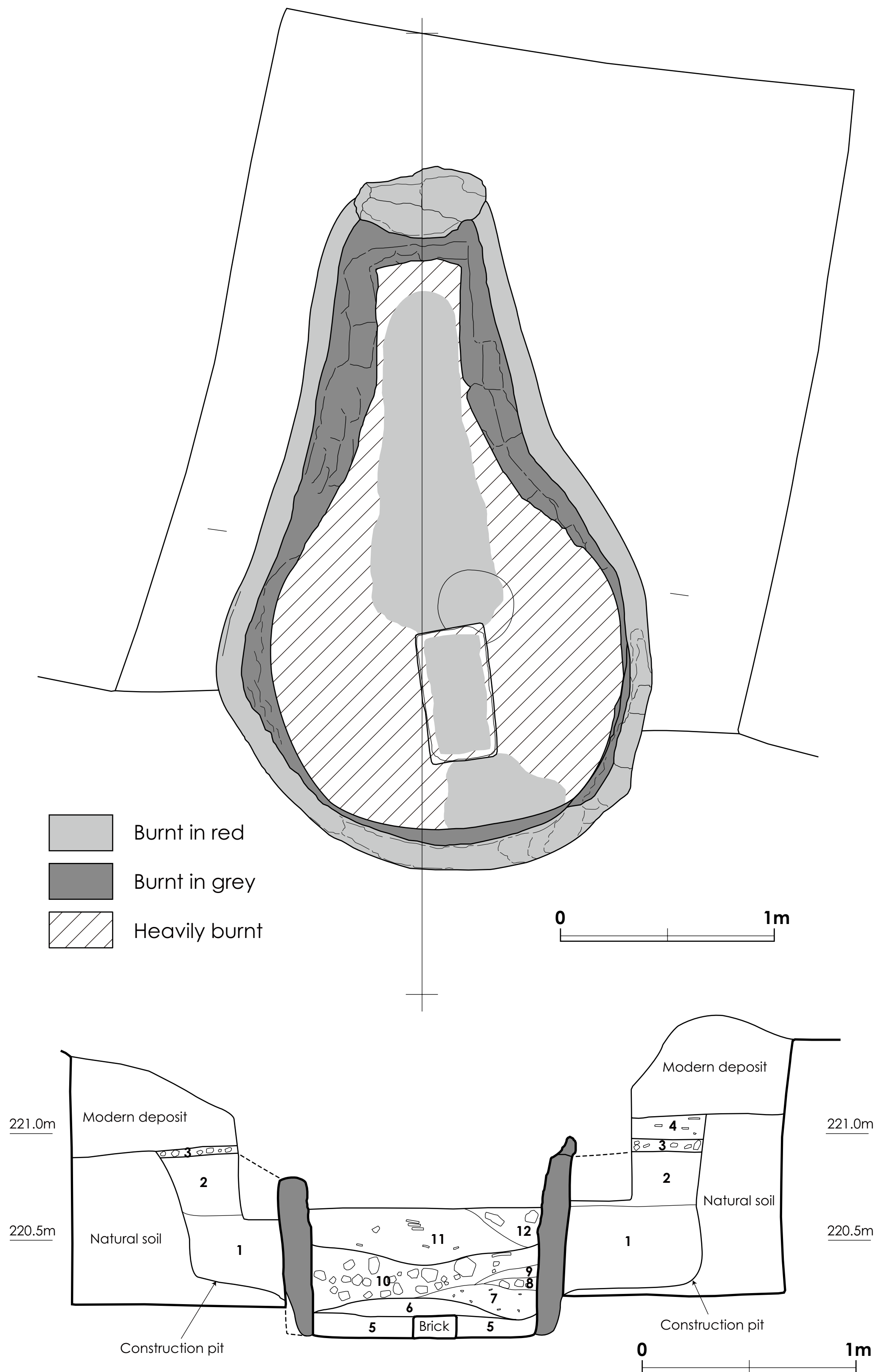


Figure 5.139 Plan and cross-section of the kiln (1:30)

1, 2: Filling in the construction pit, 3: Working floor of the kiln containing burnt clay blocks, 4: Deposition over the working floor, 5: Ash deposit, 6: Burnt soil, 7: Deposit containing ash and tiny potsherds, 8: Deposit containing burnt clay blocks; 9: Ash deposit; 10: Depost containing a large amount of burnt clay blocks, probably derived from collapsed walls , 11, 12: Deposit after the collapse of walls containing tiny potshedrs and burnt clay blocks.



Figure 5.140 Kiln



Figure 5.141 Details of the kiln

identified as the fire chamber for the kiln. It is quite likely that the pots were placed facing upwards, one above the other, and then covered before heating the kiln.

Identical kilns have been reported from the Early Harappan site of Girawad, which is 15 km south of Farmana (Shinde *et al*. 2008a). A few other Harappan sites in the Ghaggar Basin, such as Baror (Sant *et al*. 2005) and Tarkhanewala Dera (Trivedi 2009), have produced similar kinds of evidence. This is the kind of kiln that appears to be quite common in the Ghaggar Basin. Circular kilns have also been reported from the site of Harappa, but their shapes are different from those found in the Ghaggar Basin.

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CHAPTER 6

POTTERY FROM THE SETTLEMENT AREA

BY AKINORI UESUGI

1 METHOD OF DOCUMENTATION

For the documentation of pottery from the excavations, the following processes are adopted.

1 Trench-wise and layer-wise collection of pottery
2 Marking, classification and counting
3 Documentation of important specimens by scale-drawing and photographing.

During the excavation, a pottery yard was laid out at the site in order to collecting potsherds in trench-wise and layer-wise. The washing of pottery was done at this stage.

After the excavations, the potsherds collected from the excavations were transported to Department of Archaeology, Post-Graduate and Research Institute, Deccan College, Pune, and were marked and classified in terms of colours, fabrics, forms and shapes, each elements were recorded with counting and weighing. Some works were conducted at Department of History, the Maharshi Dayanand University, Rohtak as well.

In the course of the above works, potsherds which were considered important for understanding the ceramic sequence at the site were selected out and documented in detail with scale drawing and photographing (Tables 6.1 - 6.3). For selecting specimens for detailed documentation, the stylistic features, forms, shapes and preservation condition were taken into consideration. Even small potsherds were chosen when they were considered unique and important for the understanding the form and shape variations. Those which show forms and shapes were both scale-drawn and photographed and body sherds which have no information on forms and shapes but preserve decorations were subjected to documentation only by photography.

Those specimens which were scale-drawn were measured at various portions as illustrated in Figure 6.1. Although the complete specimen or specimen, the entire shape of which can be reconstructed on the drawings, are very limited in number, the formal features were attempted to be recorded by measurements. For conducting measurements, the methods by (Dales and Kenoyer 1986) and (Jenkins 1994) were referred and partially modified.

In regards to fabrics, they were observed by naked eyes and classified by the presence or absence of rocks or minerals which are larger than 0.05 cm roughly into two categories, i.e. fine and coarse. In an ideal sense, various scientific methods such as XRD analysis could better characterize the inclusions in the clay, but for this report such analyses were not conducted. Further characterization is one of the future tasks.

For the documentation of colours, "*Revised Standard Soil Color Charts*" by M. Koyama and H. Takehara which was based on the Munsell color systems was used.

The drawings published in this report are principally one thirds (1:3), although some larger specimens are made smaller to one fourth (1:4). The scales are indicated with each page of drawings. The

Table 6.1 Number of recorded potsherds from the Settlement Area at Farmana

	Total	Harappan	Non-Harappan	Historical	Total
Total	1220	476	716	28	1220
Exploration	29	3	26	0	29
Excavation	1191	473	690	28	1191
Total	1220	476	716	28	1220

Table 6.2 Area-wise number of recorded potsherds from the Settlement Area at Farmana

	Total	Harappan	Non-Harappan	Historical	Total
Total	1220	476	716	28	1220
Central Area	612	239	345	28	612
East Area	65	27	38	0	65
West Area	1	0	1	0	1
Northwest Area	142	51	91	0	142
North Extension	130	56	74	0	130
North Area	203	78	125	0	203
Kiln Area	32	19	13	0	32
Uncertain	35	6	29	0	35
Total	1220	476	716	28	1220

Table 6.3 Intactness of recorded potsherds from the Settlement Area at Farmana

	Harappan					Non-Harappan				
	Total	Complete	Rim	Body	Base	Total	Complete	Rim	Body	Base
Pot	294	2	131	88	73	488	3	370	89	26
Bowl	55	0	49	4	2	193	2	184	6	1
Jar	10	0	1	8	1	0	0	0	0	0
Dish	16	2	14	0	0	2	0	2	0	0
Dish-on-Stand	71	0	26	17	28	20	0	5	9	6
Pedestalled Bowl	0	0	0	0	0	2	0	2	0	0
Beaker	5	0	1	1	3	0	0	0	0	0
Jar or Vase	13	0	0	13	0	0	0	0	0	0
Lid	7	0	0	1	6	1	0	1	0	0
Pedestalled Bowl or Vase	0	0	0	0	0	10	0	0	2	8
Plate	5	0	5	0	0	0	0	0	0	0

photos are one half (1:2).

In this chapeter the division of the Central Area, East Area, West Area, Northwest Area, North Extension and North Area is used for specifying and simplifying the findspot of each specimens (see Figure 5.1). In addition, a stratigraphic division of the entire mound into five phases is made based on a comparison of the absolute levels of floors and structures among excavated areas (see Chapter 4), in order to specify the stratigraphic position and context of pottery.

It is noted that the information on the provenance (the area, trench, stratigraphic position) and detailed measurements of each specimen are available in the attached CD.

2 CLASSIFICATION OF FORMS

For the classification of forms, the criteria by (Dales and Kenoyer 1986) and (Jenkins 1994) are referred and partially modified. In their studies, the ratio of the internal height to the max body diameter, but the ratio of the external height to the max body diameter is considered more appropriate to express the forms by metric systems. The criteria to classify forms are as following.

However, the number of complete specimens or

those, the entire shape of which can be reconstructed on drawings is limited, resulting a difficulty to classify potsherds which preserve only the rim, body or base portion. In some instances, the external height is estimated on drawings to understand the entire shape.

Roughly based on the metric and visual criteria, a classification system is established, in which Pot, Jar, Bowl, Bowl-on-Stand, Dish and Dish-on-Stand are included. However, the distinctions among several forms are not decisive because of limited intactness of sherds. For example, the rim sherds of dish may be the rim portion of Dish-on-Stand. In the same way, the rim-neck sherds of a Pot may be classified as a Jar based on the metric criterion when the body portion was intact. Therefore the classification of forms is only convenient for the report in some sense.

Roughly using the formal classifications mentioned above, further classification by shapes, such as the rim shape, rim-neck shape or body shape, into sub-forms are made with classification numbers. For the size classification within one form or sub-form, the rim diameter (RD) is taken as a primary criterion, because other measurements cannot be the criteria for differentiation due to the scarcity of complete specimens. Other measurements are used as second or third criteria in combination with the rim diameter. The measurements were classified into classes by every 5 cm.

In the case of Pot and Jar, the ratio of the neck height (NH) to the rim diameter (RD) is calculated in order to classify metrically the relative height of neck, e.g. tall neck and short neck. As the index figure increases, given specimen is classified as a tall-necked, whereas as the figure decreases given specimen is temed a short-necked. Similarly, the degree of outcurve of neck is distinguished by the ratio of max rim diameter (MRD) to the neck diameter (ND), e.g. out-curved neck and straight neck. In this case, as the index figure increases, given specimen is sorted as a an out-curved neck, whereas the index figure becomes smaller, given specimen is described as a straight neck.

In this way various measurements were combined to see the formal features by measurements. This system may be helpful to make comparison among different sites, different regions or different periods.

The index calculated are also subjected to the classification into different classes.

3 CLASSIFICATION OF MANUFACTURING TECHNIQUE

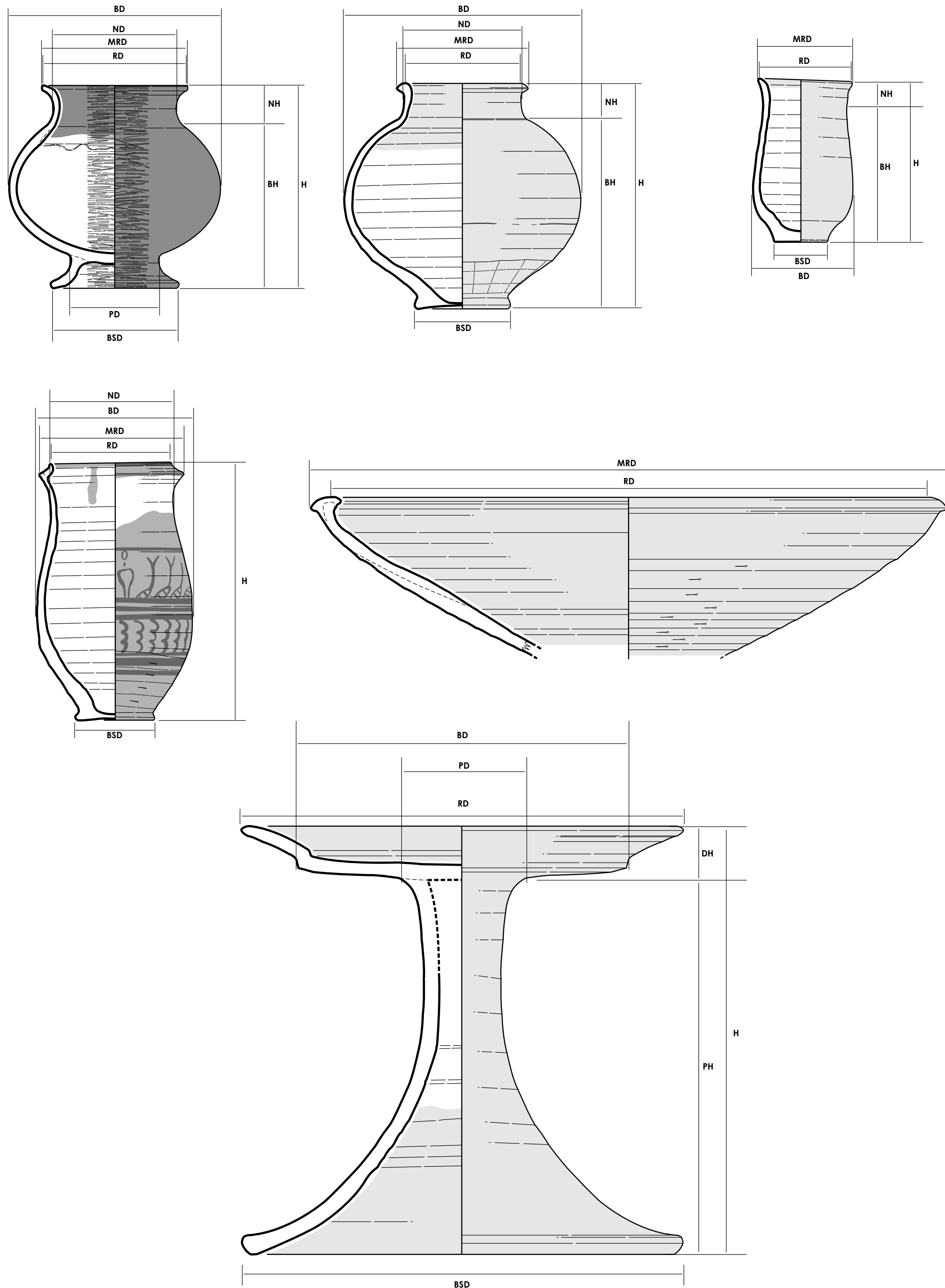
3.1 Manufactuiring process of pottery

In documenting pottery from Kanmer, not only formal features and decorations but also technical features are also paid attention. What is important in understanding the technical features is that the traces on the surface which are supposed to be related to the manufacturing technique do not necessarily reflect the entire process of manufacture but are associated with specific stages of the process. However, the close observation of traces on the surface can lead us to understand a part of the manufacturing process and to evaluate the ceramic evidence. To some extent, the manufacturing technique can provide many clues to classify different ceramic styles and to inter-regional and inter-style relations among ceramic styles.

The entire process of pottery making can be divided into the following stages based on the modern example of the ceramic production.

1 Preparation of clay
2 Primary modelling
3 Secondary modelling or remodelling
4 Surface finishing and surface treatment
5 Firing

The preparation of clay includes acquisition of clay, storage of clay, levigation, inclusion of various tempering materials. The levigation and inclusion of tempering materials can be observed on the archaeological pottery; fine-grained clay used in pottery can indicate the process of levigation, and



RD: Rim diameter; MRD: Max rim diameter; BD: Body diameter; H: Height; ND: Neck diameter; NH: Neck height; BH: Body Height; BSD: Base diameter; PH: Pedestal Height; DH: Dish height; PD: Pedestal diameter;

Figure 6.1 Measurements of various shapes

fabric with a number of inclusions may suggest that those inclusions were intentionally mixed with clay, although the original condition clay which is available to potters decisively determines the process of preparation of clay. Besides, it is possible that the modelling technique, the size of pots which were intended to be produced, and firing technique may give influence to the condition of clay. For example, modern potters pay much attention to remove rock particles from clay when they make pottery by wheel-throwing technique as their fingers may be injured by rock particles. in contrast, when a large vessel is made by coil technique or slab technique, potters include some tempering materials to keep the proper stickiness of clay. Furthermore, the specific inclusion may indicate the place or region of production of given pots.

The stage of primary modelling is the one when some shape is modelled from clay lump. Coiling, slab construction, moulding and wheel-throwing are the examples of technique which are used in this stage. In addition to these, separate modelling and jointing of different parts is also widely known. Traces of the primary modelling may be observed on the surface or in the section of archaeological pottery. For instance, a trace of luting suggests that given pot is modelled by coiling, slab technique or separate modelling and jointing.

In the stage of secondary modelling, the shape which is modelled in the primary modelling is remodelled or transformed into a different shape. For example, the modelling of a rim portion is included in this stage. Paddle and anvil technique is also representative of this stage. Another instance is remodelling of an initial shape which is made by coiling technique or slab technique using a fast wheel. However, the distinction between the primary modelling and the secondary modelling is not so clear in some cases. In the stage of the primary modelling, the entire process of modelling may be finished, like a wheel-thrown pot. Traces of secondary modelling can be observed on the surface in the form of striations caused by smoothening and scraping, and paddle and anvil impressions.

The surface finishing and surface treatment is the stage of finishing the surface by final touch of smoothening or burnishing, and by treatment of slip, painting and other decoration technique. In the same way as the case of distinction between the primary modelling and the secondary modelling, the clear distinction cannot be made between the secondary modelling and this stage in some cases. The stages of modelling and finishing described above are all related to the forms and shapes of given pots. They determine the appearance of pots. That is, the forms, shapes and appearance of pots and the modelling and finishing techniques are inter-related creating ceramic styles.

In regards to firing, there are two methods; open firing (or open kiln) and kiln firing (or closed kiln). In the archaeological pottery, it is difficult to distinguish one from another, but the hardness of pottery may reflect the firing methods. The presence or absence of black patches on the external surface may be another indicator to distinguish them. Black patches are created by the adsorption of carbon on to the external surface when some organic stuff touches the surface after firing. When a pot is fired in a kiln, the fuel is completely burnt up and the pot is not taken out from the kiln until it is cooled down. Therefore the black patches tend not to be created. In the meantime, when a pot is fired in an open space, the possibility of creation of black patches becomes more.

The colour of pots may reflect by the firing condition. While the colour is determined by temperature, amount of oxygen and elements included in clay, the enough amount of oxygen in the atmosphere of firing make the pot red in colour. On the other hand, the lack of oxygen makes a reduced atmosphere turning the colour of a pot to grey due to deoxidization of clay. An intentional supply of organic stuff in the final stage of firing or in the initial stage of cooling-off causes absorption of carbon on to the surface of pottery making black colour. Black

wares and Black-and-Red ware are the product of such firing technique to make distinctive colour..

3.2 Identification of manufacturing technique in archaeological pottery

(Figure 6.2 - 6.6)

Smoothening and scraping technique

Although the identification of various traces which are supposed to be created during the modelling process is not so easy, the forms and direction of traces can provide a clue to the identification.

Striations are the commonest trace which can be observed on the surface of pottery. They are made by touches and movement of finger or some tools on to the surface during the modelling process. The condition of striations may indicate the variety of tools used. The tools can be classified into two types; soft tools such as fingers, cloth or leather, and hard tools made of wood, bone, shell, or metal. In the case of hard tools, particles of rocks included in clay are dragged along the surface making relatively sharper and deeper striations. In addition to such striations, the impression of the edge of a tool may be left on the surface of pottery. In contrast, the use of soft tools creates smoother surface with subtle striations. According to the different strength of pressing a tool on to the surface, the smoothening technique using hard tools or soft tools and scraping technique by hard tools are distinguished from each other.

Turning to the direction of striations, the striations vary from horizontal, vertical to oblique and they can be divided into those in the regular direction and those in the irregular direction. Another point of observation is whether the striations run continuously or discontinuously. Whereas the continuous striations indicate that a tool moved along the surface pressing a tool continuously, the discontinuous striations suggest the repetition of touches and detaches to/from the surface of pottery.

Combining the observations above, the following classification can be made.

Technique 1 Continuous smoothening in a horizontal direction. (Figure 6.2: 1 - 4)
Technique 2 Continuous scraping in a horizontal direction. (Figure 6.2: 5 - 8)
Technique 3 Discontinuous smoothening in an irregular direction. (Figure 6.3: 1 - 4)
Technique 4 Discontinuous scraping in an irregular direction. (Figure 6.3: 5 - 8)

In the continuous smoothening and scraping technique, the tools moves spirally on the surface either upwards or downwards, indicating that some device with which a pot can be rotated during the execution, like a turntable and a wheel. The discontinuous smoothening and scraping are not accompanied with rotation.

Burnishing technique

The burnishing technique can be observed as smoothness of the surface, frequently accompanying a shiny surface (Figure 6.4: 1 - 4). The extraordinary smoothness without any striations can be distinguished from that of smoothening technique. The shiny surface can be created by burnishing the surface with a hard tool when a pot is dried to some extent.

Two types of traces of burnishing are observed. The first type is represented by narrow streaks recurring on the surface. Some hard tool like a pebble or a piece of bone may be used. The second type has a very smooth surface with no streak, probably burnished by cloth or leather..

4 CLASSIFICATION OF CERAMIC STYLES

On the basis of formal and technical features, the pottery from the settlement area of Farmana can be



Figure 6.2 Traces indictaing manufacturing techniques
1-4: smoothening with rotation, 5-8: scraping with rotation



Figure 6.3 Traces indictaing manufacturing techniques
1-4: smoothening without rotation, 5-8: scraping without rotation

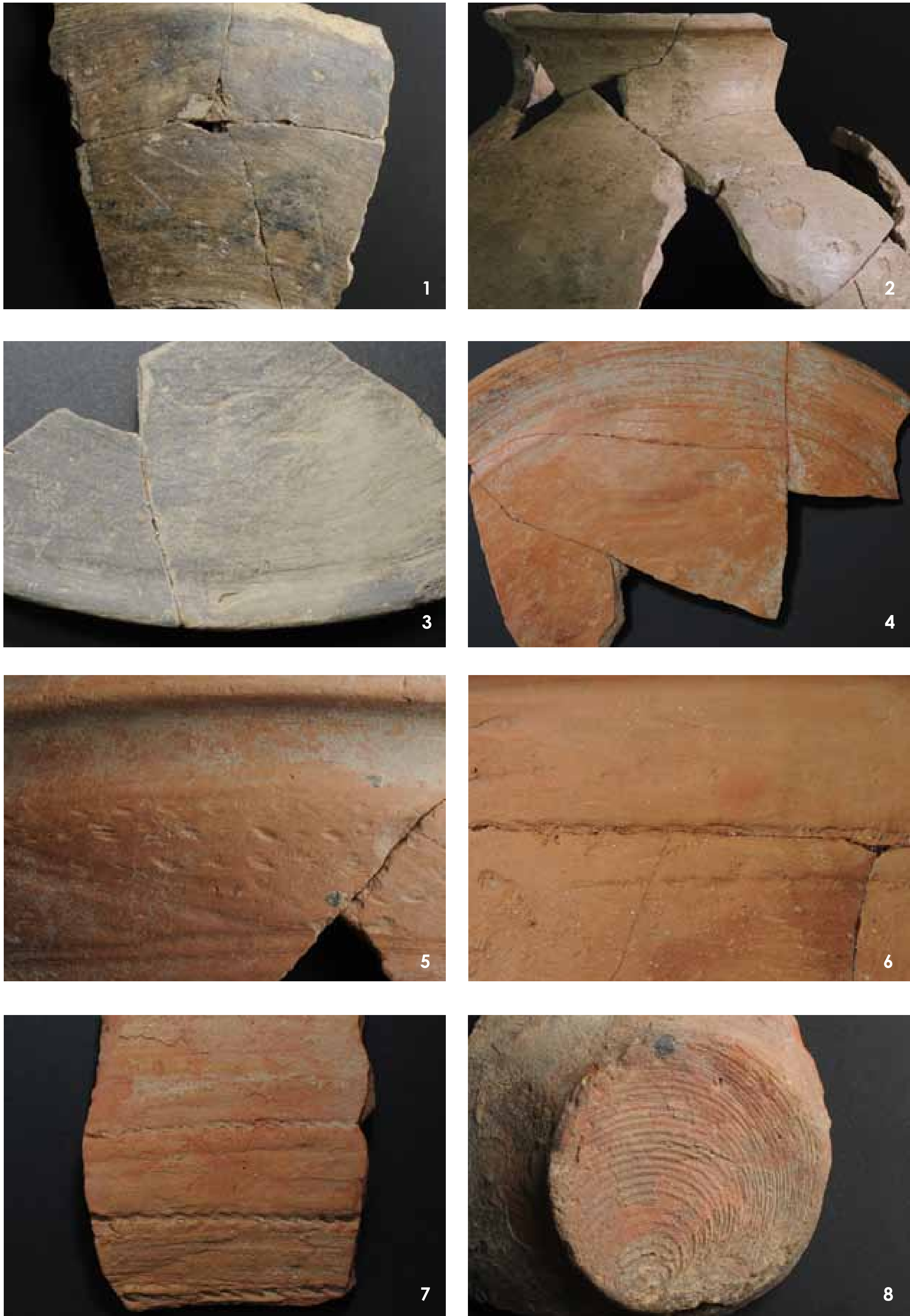


Figure 6.4 Traces indictaing manufacturing techniques
1-4: streak burnishing, 5-7: cord impressions, 8: string cut technique

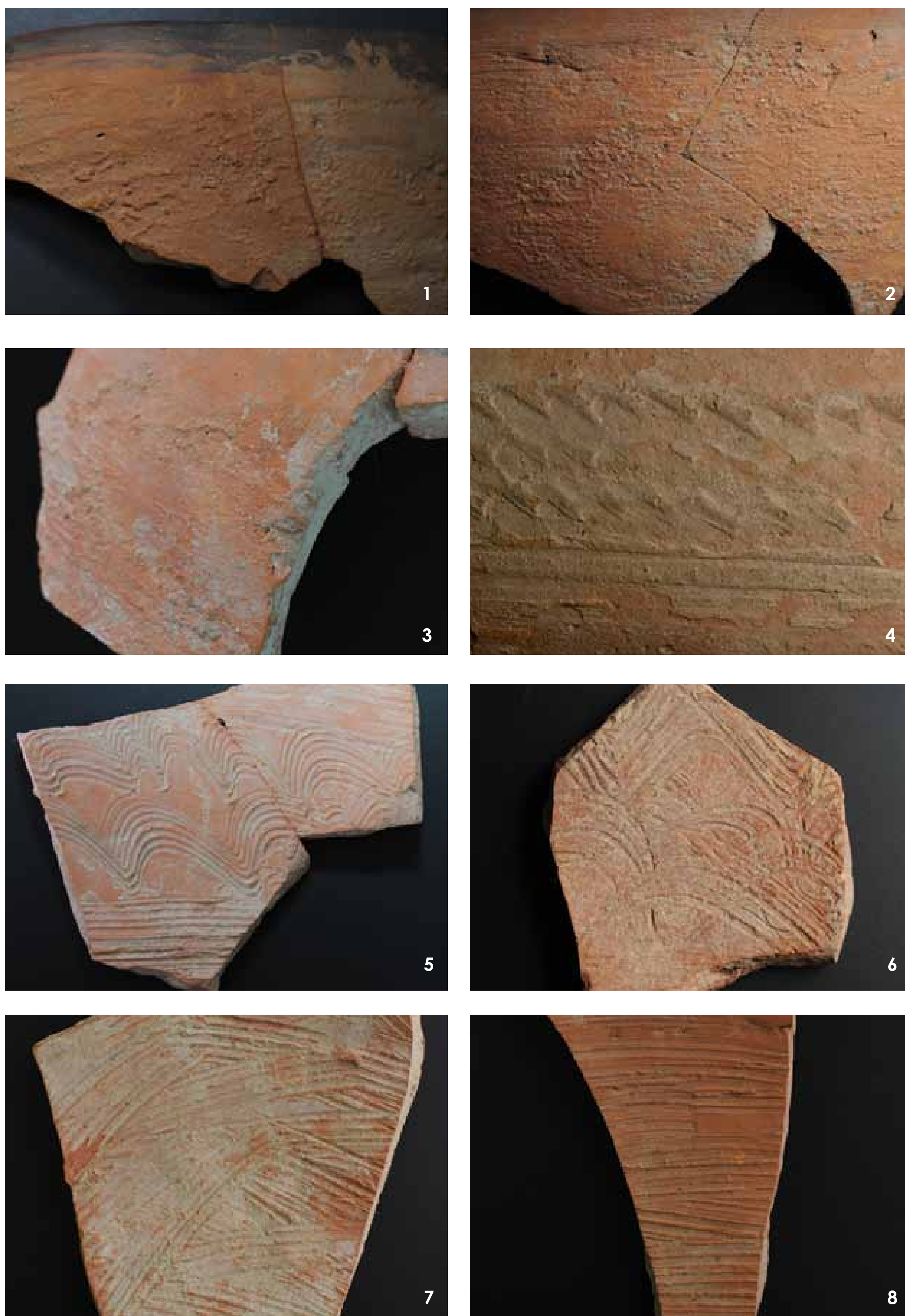


Figure 6.5 Surface treatments and decorative techniques
1-4: slurry, 5-8: parallel grooves



Figure 6.6 Decorative techniques
1: white slip, 2-6: black painting, 7-8: reserved slip technique

classified into the following three stylistic groups.

Group 1 Harappan pottery
Group 2 Non-Harappan pottery
Group 3 Historical pottery

The general features of each stylistic group are summarized below.

4.1 Harappan pottery
(Figure 6.7)

The definition of the Harappan pottery is based primarily on the pottery from Mohenjodaro in Sindh (Marshall 1931; Mackay 1938; Dales and Kenoyer 1986) and Harappa in Punjab (Wheeler 1946; Jenkins 1994). Based on the comparison with those materials from two sites, the observation on the formal and technical features were made to identify the Harappan and its related pottery.

The diagnostic feature of the Harappan pottery is not only the formal features but also the technical features with fast rotation. Very sharp striations which run continuously in a horizontal direction can be identified as those using fast rotations (see Section 3). Since in the case of the Non-Harappan pottery, the manufacturing technique which uses fast rotation is limitedly used, the observation of technical features can be one of the best criteria to distinguish the Harappan pottery from the Non-Harappan pottery.

Another diagnostic trait of the Harappan pottery is the painting style. The number of specimens with paintings is not so many, but its painting style is distinctive consisting of figurative and geometric motifs. Those from the settlement area from Farmana are peacock, pīpal leaf and water plant in figurative motifs and intersecting circles and dots-and-loops in geometric motifs. In the case of the Non-Harappan pottery, the paintings are limited in number and variety, which are distinctively different from those of the Harappan pottery. Thus, the painting style can be another clue for differentiate the Harappan pottery and the Non-Harappan pottery.

In terms of formal features, the specimens of the Harappan pottery from the settlement area of Farmana is akin to those from Mohenjodaro and Harappa. Therefore, except for some cases with only rim sherds which are difficult to determine whether they belong to the Harappan or Non-Harappan pottery, the formal feature can also be a criterion for distinction. Although there are a number of formal features to identify the Harappan pottery as shown in detail in Section 5, the most distinctive one may be a flat base as the base of the Non-Harappan pottery is dominantly a round base with a ring.

4.2 Non-Harappan pottery
(Figure 6.8, 6.9)

The Non-Harappan pottery is distinguished by modelling or surface finishing technique on the body portion, which does not use rotation, while the rim-neck portion is finished by smoothening with rotation. In other words, whereas on the rim-neck portion can be observed a series of horizontal and continuous striations, discontinuous and unidirectional striations occurs on the body portion. In a number of cases, the smoothening or scraping on the body without rotation can be observed to be executed after the smoothening with rotation on the neck. Although a possibility is not deniable that a pot was primarily modelled with fast rotation, it is quite likely that the pot was modelled not using fast rotation and then applied with surface finishing technique. A distinctive feature of the Non-Harappan pottery of a round base with an appliqué ring is another indicator of primary modelling technique without rotation.

Another distinctive manufacturing technique applied to the Non-Harappan pottery is the burnishing technique. The burnishing appears to have been done with a hard tool such as a small pebble or

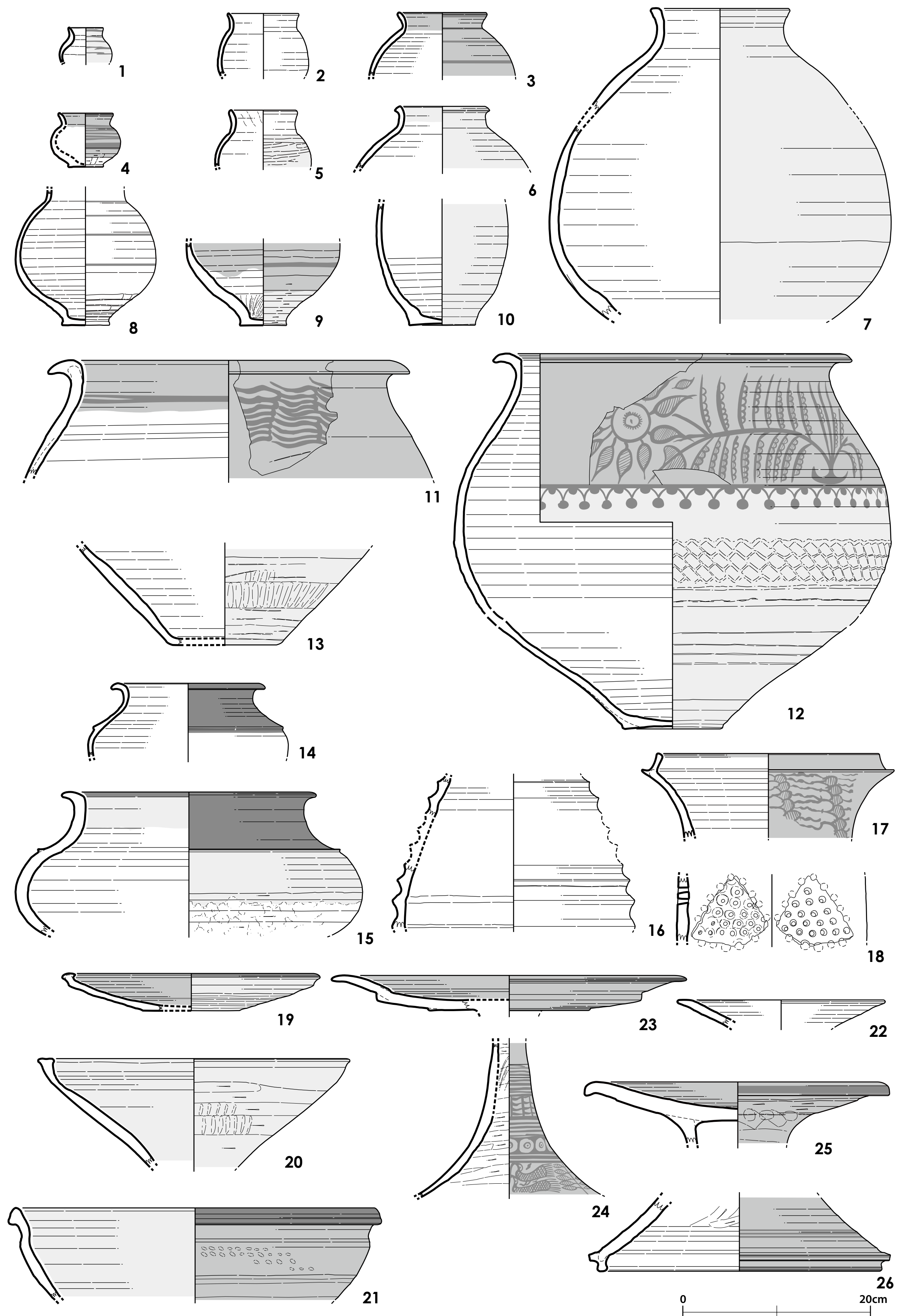


Figure 6.7 Representative types of the Harappan pottery from the Settlement Area a(1:6)
1-13: Pots, 14-15: Ledged Pots, 16: Ridged Pot, 17: S-shaped Jar,
18: Perforated Jar, 19-21: Bowls, 22: Dish, 23-26: Dish-on-Stands.

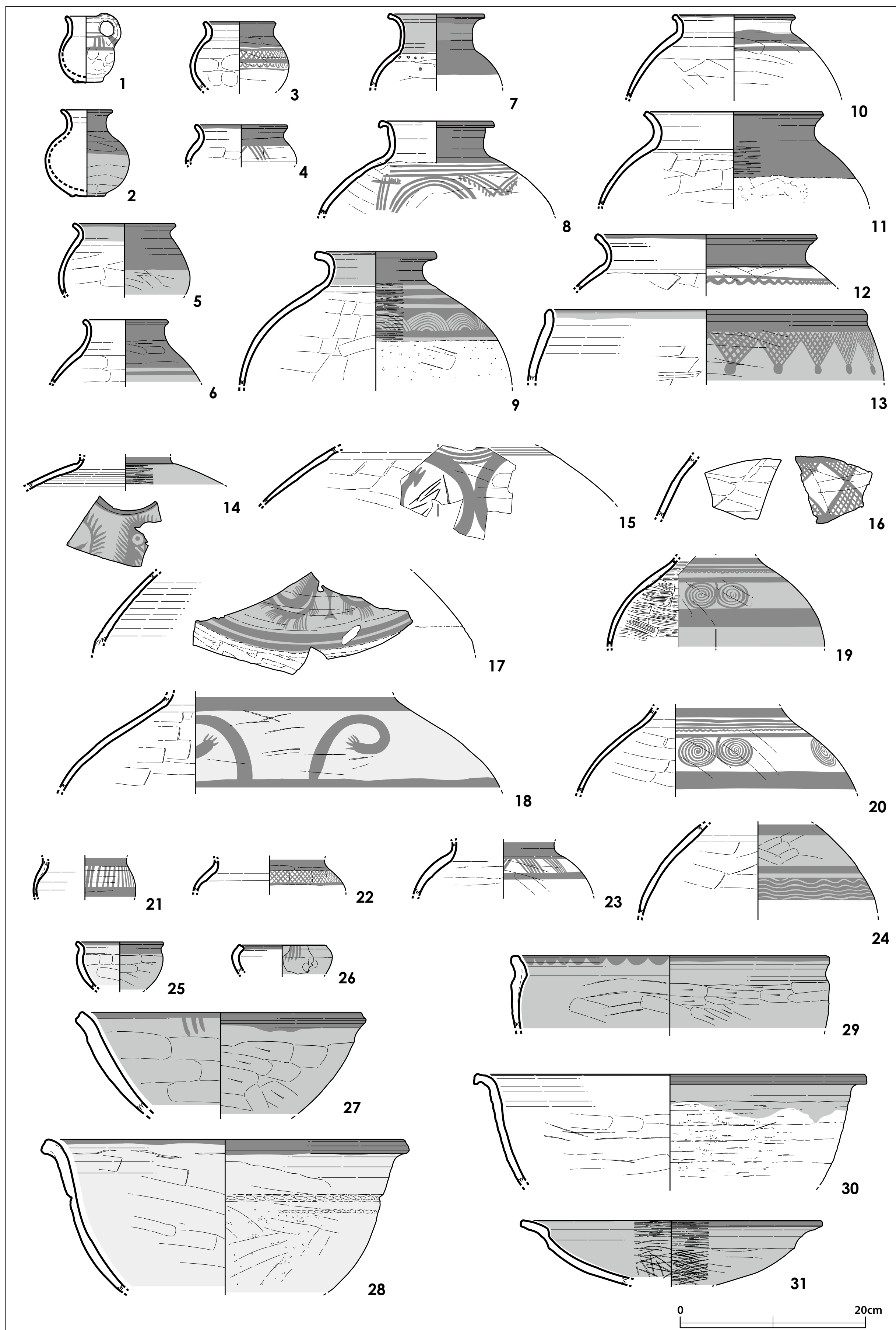


Figure 6.8 Representative types of the Non-Harappan pottery from the Settlement Area (1:6)
1-24: Pots, 25-30: Bowls, 31: Dish-on-Stands.

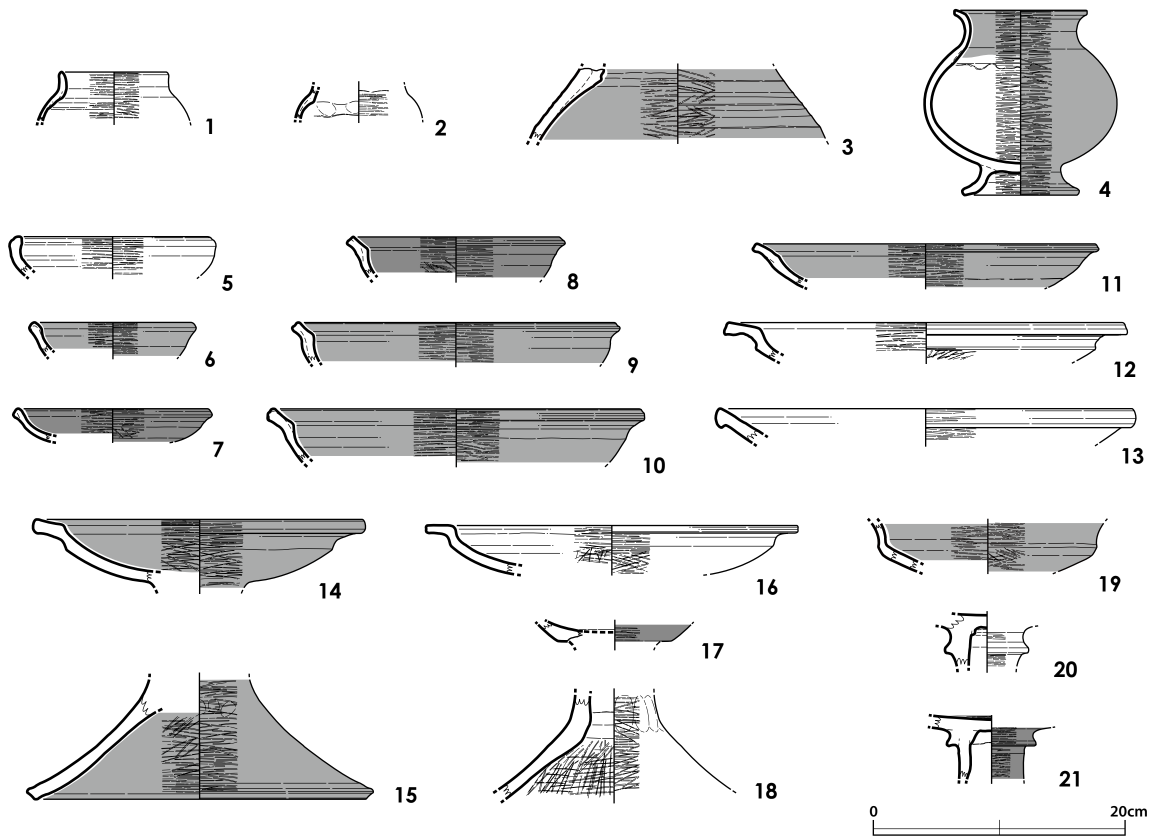


Figure 6.9 Representative types of the Non-Harappan GW pottery from the Settlement Area (1:6)
1-3: Pots, 4: Pedestalled Pot, 5-13: Bowls, 14-21: Dish-on-Stands.

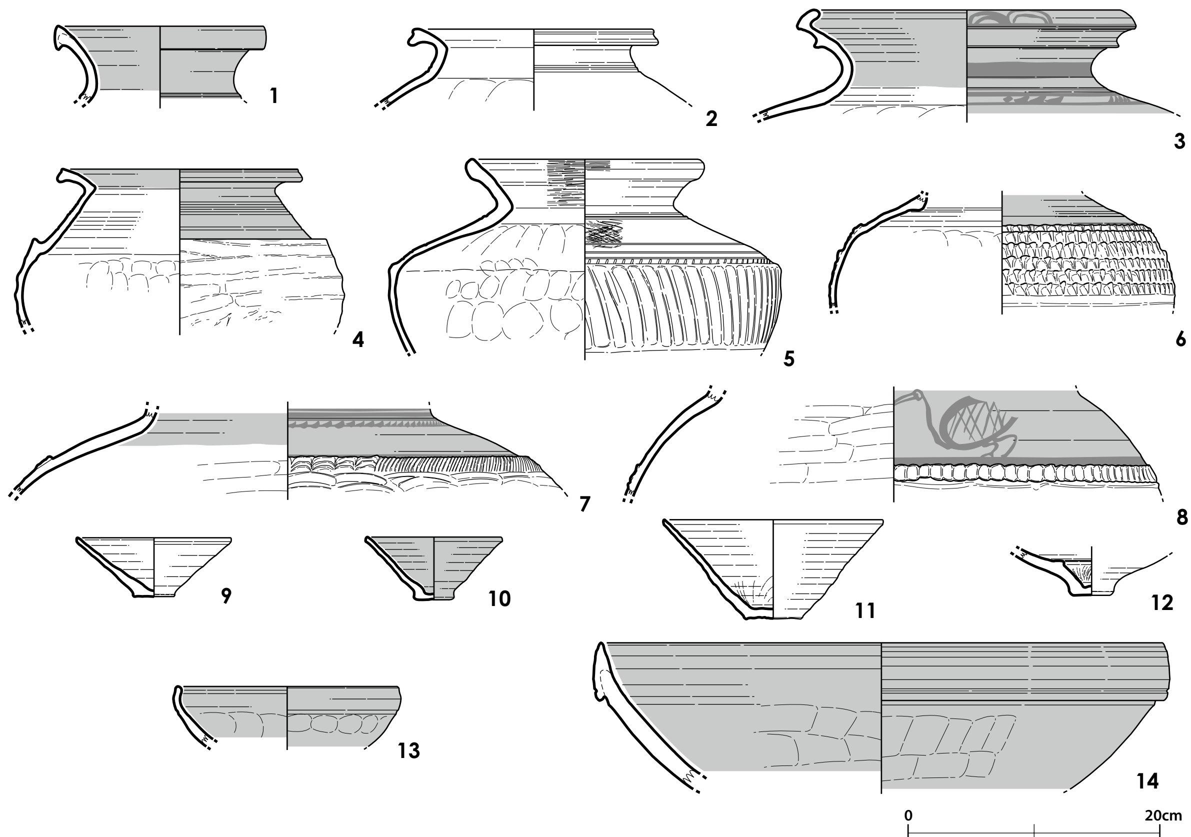


Figure 6.10 Representative types of the Historical pottery from the Settlement Area (1:6)
1-8: Pots, 9-14: Bowls.

a wooden or bone tool, leaving narrow streaks in a horizontal direction on the surface. This burnishing technique is generally seen in the Harappan pottery.

The decoration in the Non-Harappan pottery is distinguished by black band painting. Either the rim is painted with a narrow black band or the entire neck, frequently as down as the shoulder portion, is painted with a wide black band. Some cases are painted more widely down to the lower part of the body. In addition to these bands, some geometric motifs occur in some specimens, consisting of multiple loops, parallel horizontal and vertical bands, and some indeterminate motif of curvilinear strokes. The last motif may represent a horn motif. These painting motifs are easily distinguishable from those of the Harappan painted pottery.

In terms of the formal features, the Non-Harappan pottery differs from the Harappan pottery, having a simple assemblage and simple shapes. Another distinctive formal feature of the Non-Harappan pottery is a ring base, basically having a round base with a appliqué ring. The centre of the base projects downwards beyond the edge of the ring. As noted earlier, this base is a indicator of non-rotational primary modelling technique for the Non-Harappan pottery.

The Non-Harappan pottery includes the Grey ware (Figure 6.9). The observation of the surface and cores shows that they were intentionally burnt to grey by deoxidizing firing. Whereas the manufacturing technique is similar to that of the Non-Harappan Red ware summarized above, including smoothening with and without rotation and burnishing, the formal features differs both from those of the Harappan pottery and from those of the Non-Harappan pottery. Although the amount of the Grey ware is not so large, it forms a distinctive group in the ceramic assemblage at the settlement area of Farmana.

4.3 Historical pottery
(Figure 6.10)

From pits cut into the Harappan strata and structures, another distinctive pottery was found. They are distinguished by more complex formal features like rim and body shapes, distinctive decoration technique of painting, appliqué and incisions, and the manufacturing technique of smoothening with fast rotation and paddle-and-anvil techniqe. Among specimens are included moulded decorated bowls (Figures 6.121 - 6.123).

This type of pottery can typologically date to the Gupta and post-Gupta periods in the ceramic sequence in North India, which has been attested at many sites like Ahicchchhatra, Hastinapura, Sonkh and Saheth. It is also akin to a ceramic style which is called the Rang Mahal pottery in northern Rajasthan. Among the AMS dates from the upper most layers at Farmana which are associated with this type of pottery, there are four AMS ^{14}C dates which come around the 6th or 7th centuries AD. These dates may point to the date of this type of pottery.

It should be noted that a very limited number of Kushana pottery which dates back to the 2nd and 3rd centuries AD. They are incurved rim bowl and pots with stamp decoration of a triratna motif. This indicates that the site of Farmana was occupied in the Kushana period as well (as reported in the chapter of minor objects, a Mauryan or Sunga terracotta elephant figurine was also found on the surface. These facts suggest that the site was continuously occupied in the Historical period, though the number of finds datable to the Mauryan - Kushana periods are limited in number).

5 DESCRIPTION OF POTTERY

5.1 Harappan pottery

(Figures 6.11 - 6.20, Tables 6.4 - 6.18)

479 Harappan potsherds from the settlement area of Farmana were recorded and subjected to analyses and description in this report. They consist of Pot, Jar, Bowl, Dish and Dish-on-Stand. In the following section, each form is described.

Pot

The Harappan Pot can be classified into the following types based on the body shape.

Type 1 Having an elliptical or globular body shape. (n=163)
Type 2 Having a ledge on shoulder (Ledged Pot). (n=21)
Type 3 Having perforations on the body (Perforated Pot). (n=1)
Type 4 Having ridges on the body (Ridged Pot). (n=4)

[Type 1]
Classification of rim-neck shapes

Type 1 is represented by 163 specimens. The NH (neck height)/RD (rim diameter) index can be sorted as shown in Table 6.5 and Figure 6.12. This index indicates the tallness of the rim-neck portion, i.e. as the index figure become larger, the neck is taller and as the index figure decreases the neck is shorter. Table 6.5 suggests that this type has a relatively shorter neck.

Table 6.6 and Figure 6.13 shows the MRD (maximum rim diameter)/ND (neck diameter) index which indicates the curvature of the neck, i.e. out-curved neck or straight neck. As the figure increases the neck is regarded as more out-curved and as the figure becomes smaller the neck may be straight or inturned. It is indicated in this table that Type 1 is generally less out-curved.

The relations between NH/RD and MRD/ND are shown in Table 6.7. This table suggests that those with a shorter neck have a relatively less out-curved neck and the those with a taller neck include a more out-curved neck.

The rim shape can be classified into the following types (Figure 6.11).

Rim Type 1 Having a simple rounded rim. (n=56)
Rim Type 2 Having a projecting rim with a triangular section. (n=37)
Rim Type 3 Having a projecting rim in a beak shape. (n=36)
Rim Type 4 Having a projecting rim with a rectangular section. (n=1)
Rim Type 5 Having a simple rim with a flat face on the lip. (n=1)

Among the rim types above, Rim Type 1 and Rim Type 5 are quite similar in terms of having a simple rim with no projection. In Rim Type 3, there are some specimens similar to Type 5, which has a less projection.

In Table 6.8, the relations between RD classes and NH/RD+MRD/ND are shown. Whereas the NH/RD class 1 + MRD/ND class 2, NH/RD class 1 + MRD/ND class 3, NH/RD class 2 + MRD/ND class 2, NH/RD class 2 + MRD/ND class 3 and NH/RD class 3 + MRD/ND class 2 include larger specimens of more than RD Class 5, the NH/RD class 3 + MRD/ND class 3 onwards has only small specimens. In other words, those with a larger rim size tend to have a shorter and less out-curved neck.

Table 6.9 shows the relations between the Rim Types and the NH/RD + MRD/ND classes. Rim Type 1 occurs through almost all NH/RD + MRD/ND classes and Rim Types 3 and 5 also wider classes. On the other hand Rim Type 2 has a limited occurrence in shorter necks.

Table 6.10 demonstrates the relations between the Rim Types and RD classes. While Rim Type 3 occurs through the RD classes, Rim Type 1 and Rim

Rim Type 1

Rim Type 2

Rim Type 3

Rim Type 4

Rim Type 4

Elliptical body

Globular body

Oblong body

Disc base

Flat base

Figure 6.11 Formal classification of the Harappan Pot Type 1 (not to scale)

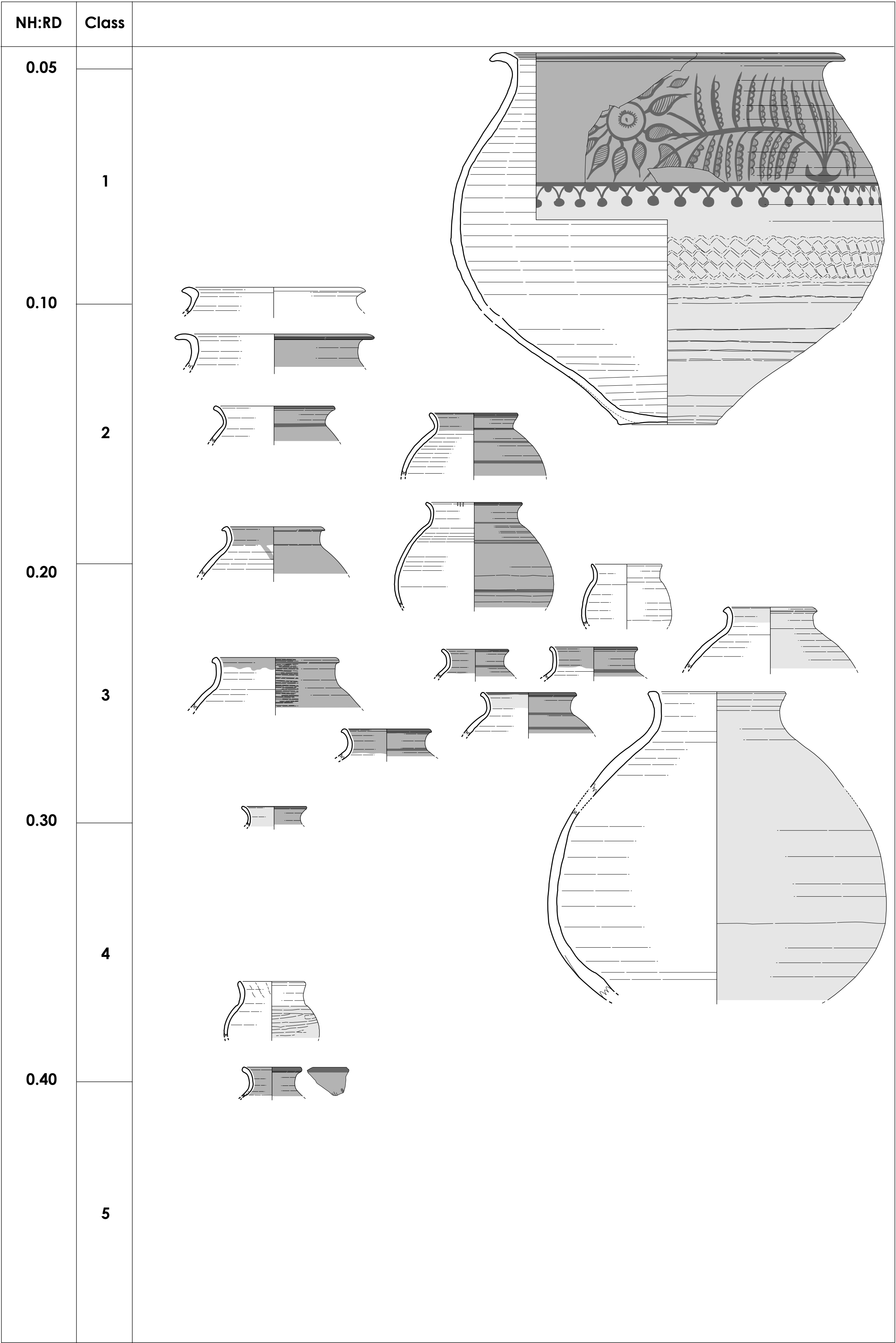


Figure 6.12 NH/RD distribution of the Harappan Pot Type 1 with representative specimens (1:6)

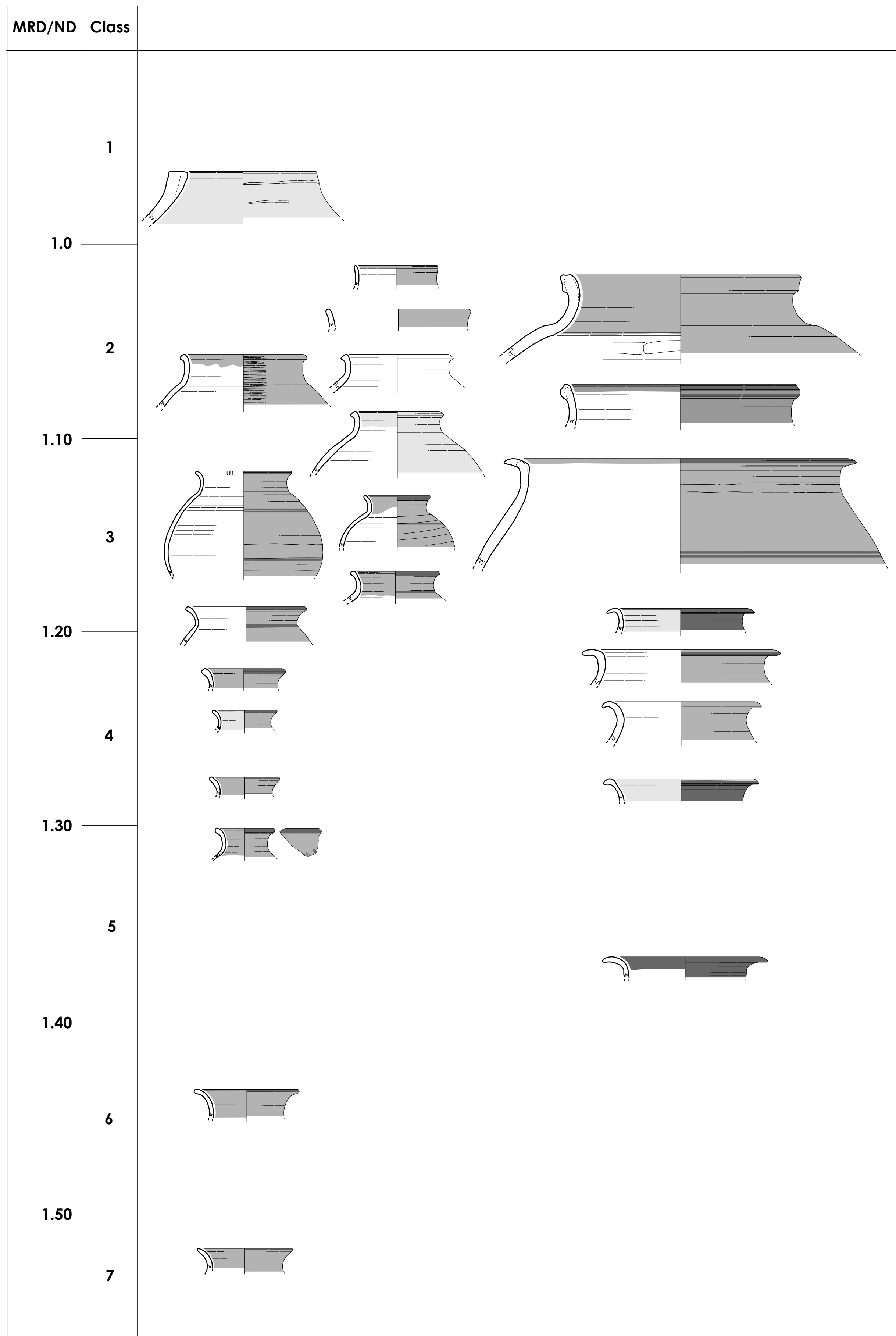


Figure 6.13 MRD/ND distribution of the Harappan Pot Type 1 with representative specimens (1:6)

Type 5 tend to be confined to smaller classes. On the other hand, Rim Type 2 is more widely distributed in larger classes.

Classification of body shapes

Turning our eyes towards the body shape, there are three types of shape (Figure 6.11). Only 16 specimens are subjected to classification of body shapes.

Body Type 1 Globular. (n=9)

Body Type 2 Elliptical. (n=7)

Body Type 3 Oblong. (n=1)

The base can be classified into the following types based on 22 specimens (Figure 6.11).

Base Type 1 Disc base having a smaller diameter. (n=16)

Base Type 2 Flat base having a larger diameter. (n=6)

Manufacturing technique of the Harappan Pot

In regards to the manufacturing technique applied to the Harappan Pot, sharp striations can be observed on the entire surface indicating a modelling or surface finishing with fast rotation. In addition to the traces of smoothening with fast rotation, the scarping with rotation is another common feature which is observable in the Harappan Pot. It is applied to the external surface of the lower part of the body. The scraping can be identified by movements of rock or sand particles caused by the use of a hard tool. The horizontal and continuous striations indicate that the scraping was done with rotation. However, probably due to that scraping was conducted when a pot was semi-dried, the tool did not move smoothly on the surface of the pot creating a series of impressions of the edge of the tool on the surface.

Although the burnishing is not common in the Harappan pottery, there are a few specimens which are finished with burnishing (three specimens in number). The streaks measuring 1 mm in width run densely in a horizontal direction. Those with extremely smooth surface may have been burnished by a soft tool like a cloth or leather.

Rope impressions on the external surface can be considered relating to a technique in the manufacturing process. In some specimens they remain in two or three courses. As they tend to occur in larger specimens, it may be likely that the ripe was used for retaining a shape of a larger pot during a process of drying.

Table 6.4 Distribution of RD Classes of the Harappan Pot Type 1

RD/	***Range (cm)***	***no.***
Class 1	0.1-5.0	2
Class 2	5.1 - 10.0	44
Class 3	10.1 -15.0	42
Class 4	15.1 - 20.0	16
Class 5	20.1 - 25.0	5
Class 6	25.1 - 30.0	5
Class 7	30.1 - 35.0	2
Class 8	35.1 - 40.0	8
Class 9	40.1 - 45.0	1
Class 10	45.1 - 50.0	3
Class 11	50.1 -	3

Table 6.5 Distribution of NH/RD Classes of the Harappan Pot Type 1

NH/RD	***Range***	***no.***
Class 1	- 0.1	12
Class 2	0.11 - 0.20	27
Class 3	0.21 - 0.30	24
Class 4	0.31 - 0.40	2
Class 5	0.41 -	0

Table 6.6 Distribution of MRD/ND Classes of the Harappan Pot Type 1

MRD/ND	***Range***	***no.***
Class 1	- 1.0	0
Class 2	1.01 - 1.10	40
Class 3	1.11 - 1.20	53
Class 4	1.21 - 1.30	15
Class 5	1.31 - 1.40	3
Class 6	1.41 - 1.50	1
Class 7	1.51 -	1

Decoration of the Harappan Pot

In regards to the decoration technique, a slip and paintings are observed. The slip varies from red to

Table 6.7 Relations between NH/RD Classes and MRD/ND Classes of the Harappan Pot Type 1

		NH/RD				
		1	**2**	**3**	**4**	**5**
MRD/ND	**1**	0	1	0	0	0
	2	5	16	8	1	0
	3	5	14	12	0	0
	4	0	0	4	0	0
	5	0	0	0	1	0
	6	0	0	0	0	0
	7	0	0	0	0	0

Table 6.8 Relations between RD Classes and NH/RD + MRD/ND Classes of the Harappan Pot Type 1

		RD Class										
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
NH/RD+MRD/ND	**1/2**	0	0	0	2	0	0	0	1	0	1	1
	1/3	0	0	1	0	0	0	1	1	0	1	1
	2/1	0	0	0	1	0	0	0	0	0	0	0
	2/2	1	2	11	1	0	1	0	0	0	0	0
	2/3	0	3	6	3	1	0	0	1	0	0	0
	3/2	1	5	1	0	0	1	0	0	0	0	0
	3/3	0	9	2	1	0	0	0	0	0	0	0
	3/4	0	3	1	0	0	0	0	0	0	0	0
	4/2	0	1	0	0	0	0	0	0	0	0	0
	4/5	0	1	0	0	0	0	0	0	0	0	0

Table 6.9 Relations between Rim Types and NH/RD + MRD/ND Classes of the Harappan Pot Type 1

		Rim Type					
		1	**2**	**3**	**4**	**5**	**6**
NH/RD+MRD/ND	**1/2**	0	3	2	0	0	0
	1/3	0	0	5	0	0	0
	2/1	0	0	0	0	1	0
	2/2	9	9	7	0	0	0
	2/3	6	3	5	0	0	0
	3/2	4	3	0	1	0	0
	3/3	9	3	0	0	2	0
	3/4	3	1	0	0	0	0
	4/2	1	0	0	0	0	0
	4/5	1	0	0	0	0	0

Table 6.10 Relations between Rim Types and RD Classes of the Harappan Pot Type 1

		Rim Type				
		1	**2**	**3**	**4**	**5**
RD	**1**	2	0	0	0	0
	2	34	10	0	0	0
	3	21	13	7	0	1
	4	4	2	9	0	1
	5	1	1	3	0	0
	6	0	2	2	1	0
	7	0	1	1	0	0
	8	0	2	6	0	0
	9	0	0	1	0	0
	10	0	0	3	0	0
	11	0	0	3	0	0

whitish in colour. The whitish slip can be identified by observing the section colour and the surface colour as whereas the section shows red in colour, the surface shows white in colour. In some specimens, the white slip forms a thin layer. It is also quite common that a red slip or black paintings are executed over a white slip. A slip brighter than the surface is regarded a white slip in this report.

The number of painted specimens is limited, but they can be classified into two groups; one group is distinguished by multi-registers in each of which figurative motifs or geometric motifs are filled, and another group is simply painted with a narrow bands. The figurative motifs includes peacock, pīpal leaf and water plant, and the geometric motifs consists of dots-and-loops, sun-like motif and intersecting circles. In those with narrow bands, the bands are arranged at intervals around the body.

In one specimen (no. 539) which the whole shape can be reconstructed on drawings, the arrangements of painting designs can be understood. The external surface is divided into two parts by a horizontal band, in the upper part of which red slip is applied and in the lower of which a white slip is executed. The rim is painted with a narrow band. In the upper part of the body, a sun-like motif consisting of a dot, concentric circles and leaves and a branched tree are depicted. In leaves accompanying the sun-like motif, an oblique hatch is filled in. The tree diverges in two branches, each of which bears leaves. A leaf is comprised by a lenticular stroke and a series of small loops with hatches. In the basement of the tree, a pair of horn-like projections is added. The horizontal band in the middle of the body is accompanied with dots-and-loops. On the external surface of the middle of the body is applied thin slurry with denticulated patter made by strokes of a tool of angular edge.

One specimen (no. 40), a body sherd probably having a squatting body, is painted with parallel horizontal bands and a series of small simplified pīpal leafs. The pīpal leaf is filled with oblique hatches.

One specimen (no. 37) is a sherd of the upper part of a body of a large Pot/Jar, having two parallel horizontal bands at the juncture between the neck and the body and on shoulder. The band on the shoulder is accompanied with loops.

In one specimen (no. 734), a shared of the upper part of the body of a small Pot, oblique chequerboard pattern is filled in a register which is demarcated by parallel horizontal bands.

In one specimen (no. 906), a sherd of the upper part of the body of a large Pot/Jar, a row of water plants is arranged in a vertical direction above two parallel horizontal bands on the shoulder. Below the bands, a part of a dot is intact indicating that the band was accompanied with dots-and-loops.

One specimen (no. 897), a shaerd of the upper part of the body of a large Pot/Jar, is painted with water plants arranged in a vertical row.

In one specimen (no. 363), a rim sherd of a small Pot, a part of oblique parallel strokes is intact. Three specimens (nos. 626, 905, 931) are body sherds of large Pots/Jars, having parallel horizontal bands and dots-and-loops intact. In one specimen (no. 905) a part of a design consisting of horizontal strokes and parallel oblique strokes are observable above a horizontal band, though its whole design is uncertain.

One specimen (no. 487) is intact from the neck down to the base. The entire external surface is slipped in red. The external surface of neck is painted over in black and three parallel horizontal bands are around the juncture between the neck and the body. Another horizontal band on the lower part of the body, with the bands on the neck, demarcates a wide register on the body, in which a pair of humped bulls facing each other is depicted. The humped bulls are distinguished by a slender proportion, having a projecting head with a pair of short horns and ears. A hump is clearly depicted on the back. Three fingers are expresses in the tip of their feet.

[Type 2]

20 specimens were recorded in Type 2 (Figure 6.14). Only three specimens are intact with a rim, and

the rest are body sherds. However, the rim portion of the Ledged Pot may be included in Type 1 as the rim sherds with no body cannot be recognized as belong to a Ledged Pot.

Three rim sherds show a projecting rim in a beak shape, having a range of 13.0 - 32.2 cm in RD (Table 6.11). Two specimens are painted with a narrow band only on the rim and one specimen is painted over on the external side of the rim-neck and the shoulder down to the ledge.

The body has a globular or squat globular shape. One specimen (no. 49) which is well intact with the body is a good example of a squat globular body. Another specimen (no. 835) is likely to have a globular body. The diameter at the ledge ranges from 16.2 cm to 43.6 cm, almost corresponding to the distribution of RD. Seventeen specimens including the rim sherds mentioned above are painted with a wide black band to the ledge. In five specimens is observed thin slurry on the external surface of the lower part of the body below the ledge, indicating a possibility that they were used as a cooking pot.

Table 6.11 Distribution of RD Classes of the Harappan Pot Type 2

BD class	*Range (cm)*	*n*
Class 1	0.1 - 5.0	0
Class 2	5.1 - 10.0	0
Class 3	10.1 - 15.0	0
Class 4	15.1 - 20.0	6
Class 5	20.1 - 25.0	8
Class 6	25.1 - 30.0	2
Class 7	30.1 - 35.0	1
Class 8	35.1 - 40.0	1
Class 9	40.1 - 45.0	1
Class 10	45.1 - 50.0	0
Class 11	50.1 -	0

[Type 3]

Only one specimen was recorded in Type 3 (Figure 6.14). It has a globular body, measuring 19.0

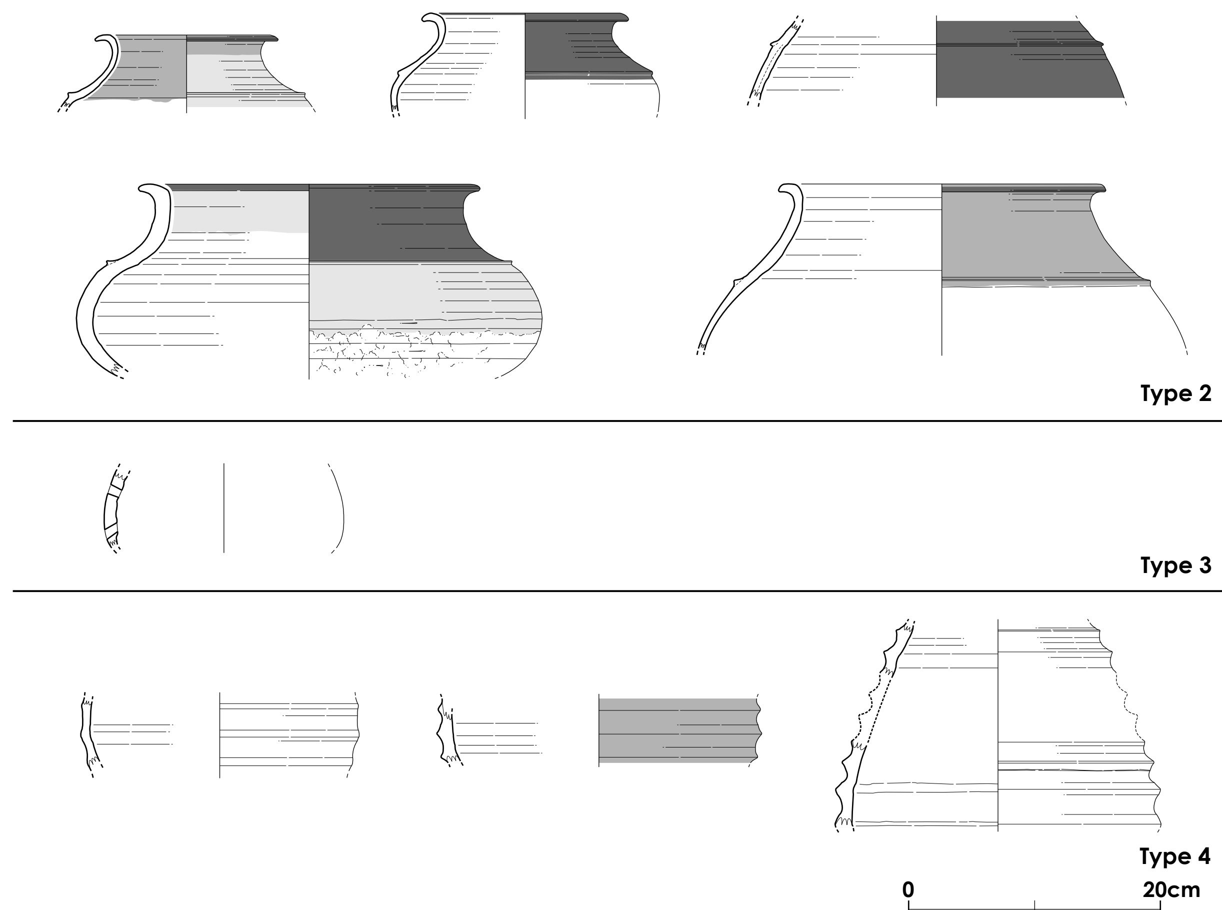


Figure 6.14 Harappan Pot Types 2 - 4 (1:6)

cm in BD. It is perforated with a number of holes, which were made from the external side into the internal side.

[Type 4]

Type 4 is represented by only three specimens (Figure 6.14). It is distinguished by ridges of a triangular section on the external side, which are made by appliqué bands. Whereas in nos. 749 and 921 the ridges are low, one specimen (no. 350) has prominent ridges. Although the whole shape is not clear, it may be elliptical in shape, having a range of 22.0 - 26.7 cm in BD. One specimen is slipped in whitish colour and other two are plain.

Jar

The Jar can be classified into the following two types (Figure 6.15).

Type 1 S-shaped Jar. (n=3)
Type 2 Perforated Jar. (n=7)

[Type 1]

Three specimens were recorded in Type 1, among which one sherd includes a rim portion and other two are body sherds. The rim sherd (no. 476) consists of an gently out-curved neck and a flanged rim to receive a lid. It measures 23.4 cm in RD and 26.7 cm in the flange. A narrow black band is painted respectively on the rim and the flange and vertical rows of water plants are arranged on the neck. The water plant is comprised of a fan-shaped portion filled with oblique hatches and a wavy stroke.

One body sherd (no. 477) which is likely belong to the neck portion is painted with two registers demarcated with horizontal bands. In the upper register are painted with vertical rows of water plants and in the lower register is a horizontal row of X-shaped motifs. The water plant consists of an oblong or circular portion filled with oblique hatches and a wavy stroke. In another specimen (no. 482), two registers of paintings are intact. In the upper register is filled with vertical rows of water plants and circles with a circlet inside. The circles are made by leaving unpainted area in a circle. One of the circlets is accompanied with hatches. The water plant consists of a circle with oblique hatch and a wavy stroke.

[Type 2]

Seven specimens of Type 3 were recorded. Among which six specimens are body sherds and one specimen is a base sherd. The body sherds show a cylindrical shape perforated from the external side to the internal side. They meaure 17.9 cm to 24.8 cm in BD. The base sherd (no. 629) has a hole of 6.4 cm in diameter. The body is perforated with holes to the juncture with the base. It measures 11.0 cm in BSD. The ratio of the hole to the BSD is 0.58.

[Painted sherds of the body of Pot or Jar]

In this section painted sherds of Pots or Jars are described (Figure 6.16).

One specimen (no. 262) is painted with intersecting circles with sun-like motifs and leaves. Another two specimens (nos. 479, 275) are also painted with similar design having sun-like motifs and elongated bars. Two specimens (nos. 927, 928) are likely to have a similar design. In one specimen (no. 628), a part of pīpal leaf is intact. One specimen (no. 480) shows a part possibly of intersecting circles and a sun-like motif, parallel horizontal bands and loops. In two specimens (nos. 932, 934), a part of vertical rows of continuous loops is intact. One specimen (no. 929) is likely to have a water plant and a leaf. In one specimen (no. 933), a part of branched plant with leaves is visible. Oblique hatches are filled in leaves. A pīpal leaf is painted in one specimen (no. 930).

Beaker

Five specimens were recorded in Beaker (Figure 6.15), among which one sherd is intact with a rim, one sherd with the body portion and four specimens of the base.

One sherd with a rim (no. 877) shows a gently

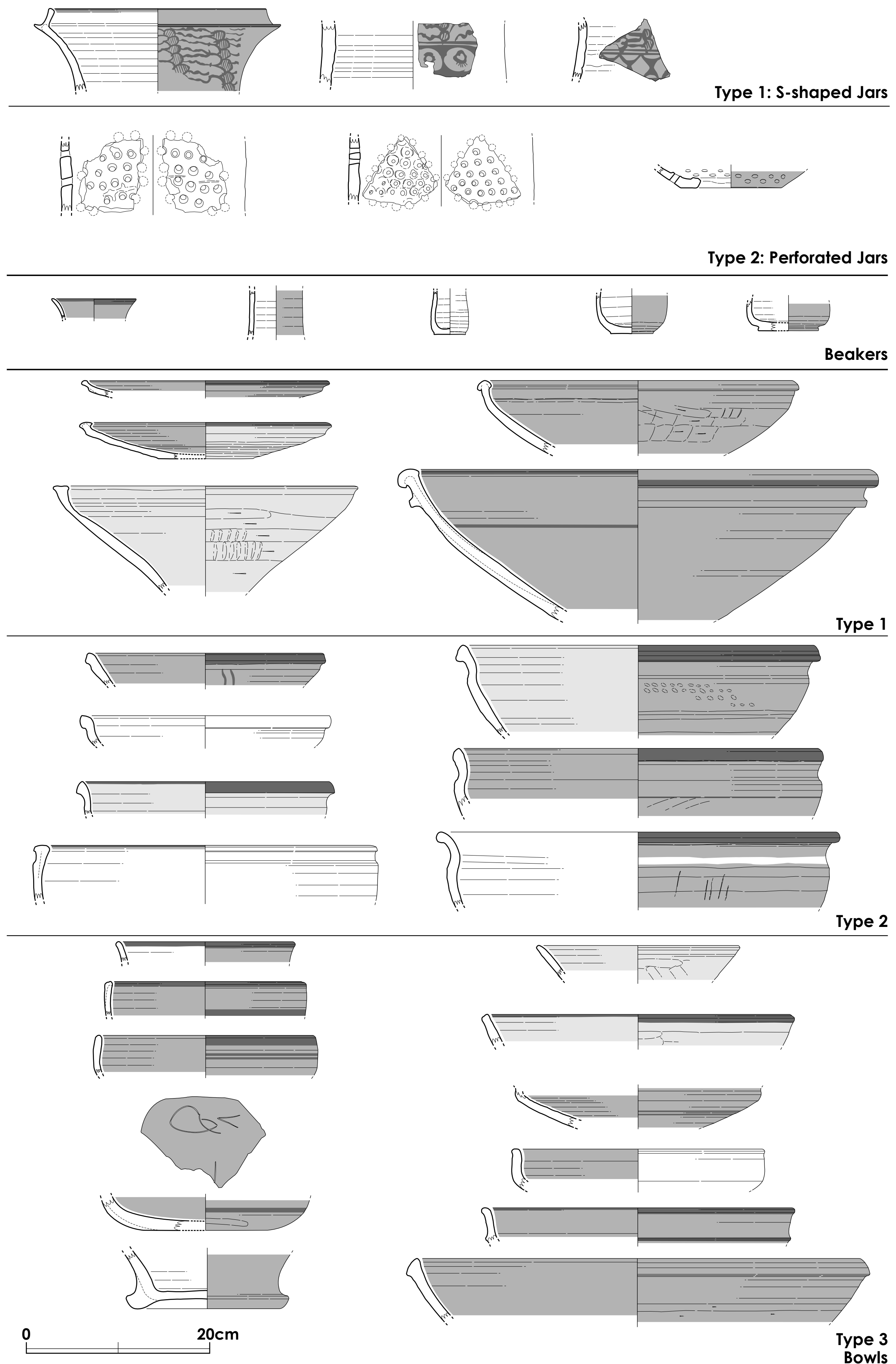


Figure 6.15 Harappan Jars, Bowls and Beakers (1:6)

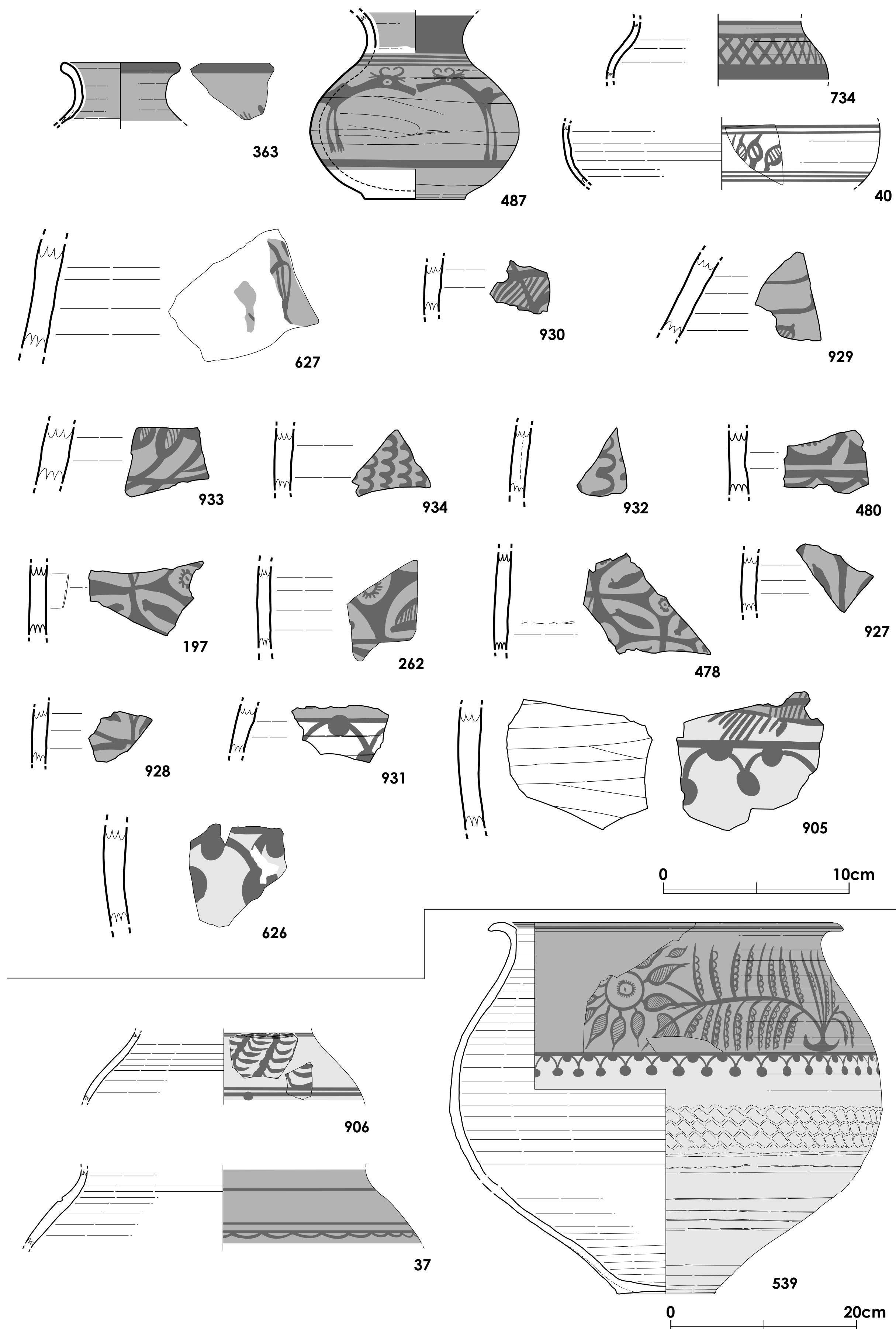


Figure 6.16 Painted motifs and patterns of the Non-Harappan pottery with representative specimens (1:6)

Table 6.12 Distribution of RD Classes of the Harappan Bowl Type 1

RD class	Range (cm)	n
Class 1	0.1 - 5.0	0
Class 2	5.1 - 10.0	0
Class 3	10.1 - 15.0	0
Class 4	15.1 - 20.0	0
Class 5	20.1 - 25.0	0
Class 6	25.1 - 30.0	7
Class 7	30.1 - 35.0	10
Class 8	35.1 - 40.0	4
Class 9	40.1 - 45.0	3
Class 10	45.1 - 50.0	3
Class 11	50.1 -	0

Table 6.13 Distribution of RD Classes of the Harappan Bowl Type 2

RD class	Range (cm)	n
Class 1	0.1 - 5.0	0
Class 2	5.1 - 10.0	0
Class 3	10.1 - 15.0	0
Class 4	15.1 - 20.0	0
Class 5	20.1 - 25.0	0
Class 6	25.1 - 30.0	3
Class 7	30.1 - 35.0	1
Class 8	35.1 - 40.0	5
Class 9	40.1 - 45.0	2
Class 10	45.1 - 50.0	2
Class 11	50.1 -	0

out-curved rim-neck, measuring 9.1 cm in RD and 0.3 cm in thickness of walls. The surface is smoothened with rotation and is slipped in red. A narrow black band is painted on the rim.

One body sherd (no. 265) shows a cylindrical shape, measuring 6.0 cm in BD. The entire surface is smoothened with rotation. It is slipped in red on the external surface.

The base is flat in alls specimens. The lower part of the body is slightly bulging extending to the cylindrical upper body. It measures 3.5 cm to 6.6 cm in BSD. The entire surface is smoothened with rotation and the external surface of the lower part of the body is finished by shallow scraping with rotation. Among them, two specimens are slipped in red on the external surface.

Bowl

57 specimens were recorded in Bowls. They can be classified into the following types (Figure 6.15).

Type 1 Having a rim projecting on both external and internal sides (Nail-headed Rim Bowl). (n=28)

Type 2 Having a rim projecting with a triangular section. (n=17)

Type 3 Other unique specimens. (n=9)

[Type 1]

Type 1 is distinguished by a so-called ail-headed rim projecting on both external and internal sides. Twenty-eight specimens were recorded in this type. Although it is difficult to determine due to a limited intactness, they include shallow and deeper ones. For instance, no. 9 can be regarded as having a shallow body, whereas no. 218 has a deeper body. They vary from 26.2 cm to 50.0 cm in RD showing that this type of bowls tends to be larger ones (Table 6.12, Figure 6.17).

Four specimens are painted with a narrow black band on the rim, among which three specimens is slipped in red and one is in white. Those only with a slip, either red or white, count 14 specimens and seven specimens are plain. In one specimen from the surface (no. 1118) a projecting band of a rectangular section is applied on the external side below the rim and a one horizontal band is painted in black on the internal surface.

In regards to the manufacturing technique, the entire surface is smoothened with rotation and the external surface of the lower part of the body is finished by scraping with rotation.

[Type 2]

Type 2 has a projecting rim with a triangular section and a body with a ridge. Seventeen specimens were recorded in this type. They show a range of 25.4 - 50.0 cm in RD in 13 specimens or a range of Classes 6 to 9 (Table 6.13, Figure 6.18).

One specimen (no. 301) is the best example of this type having a deeper body and an out-curved

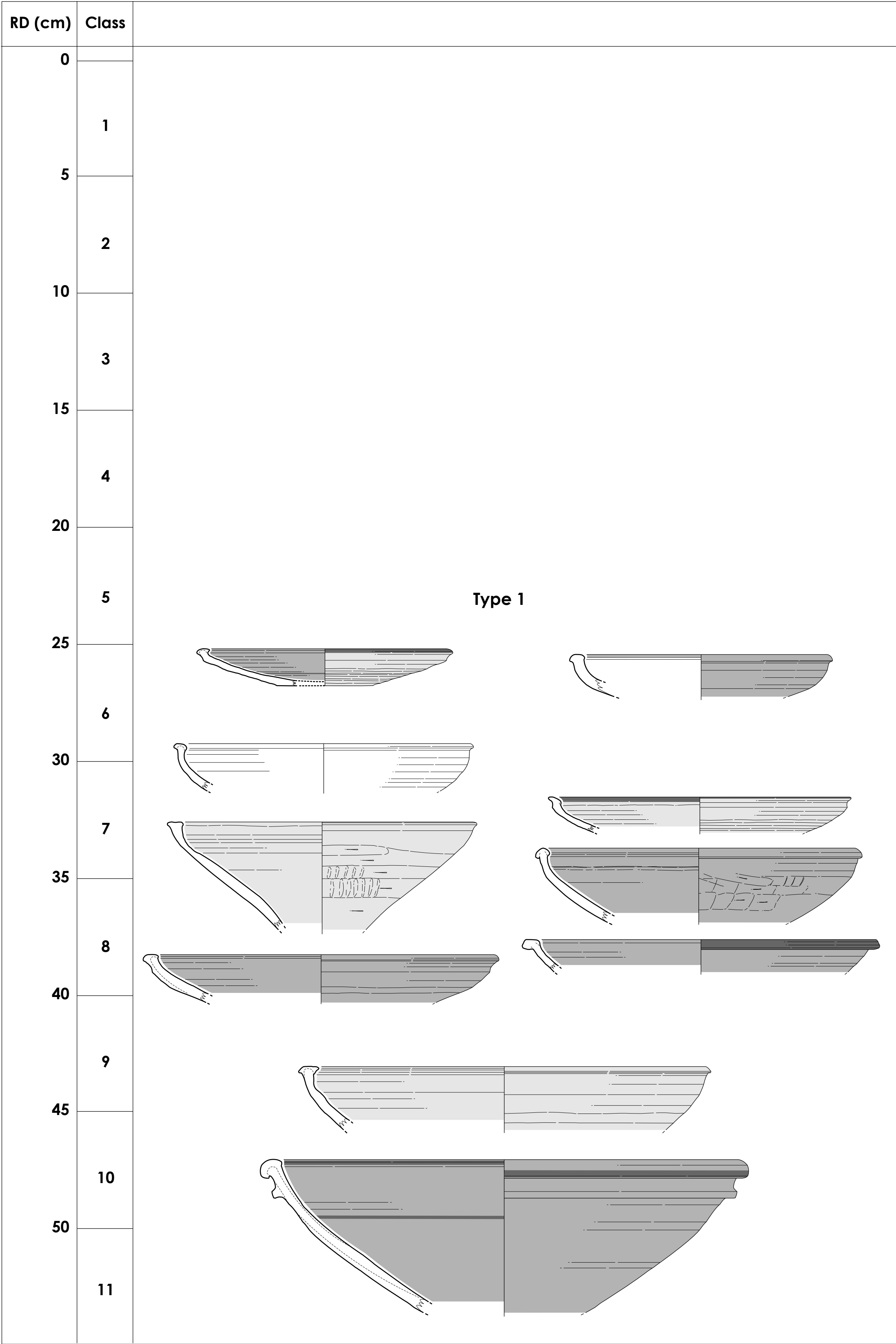


Figure 6.17 RD distribution of the Harappan Bowls with representative specimens (1:6)

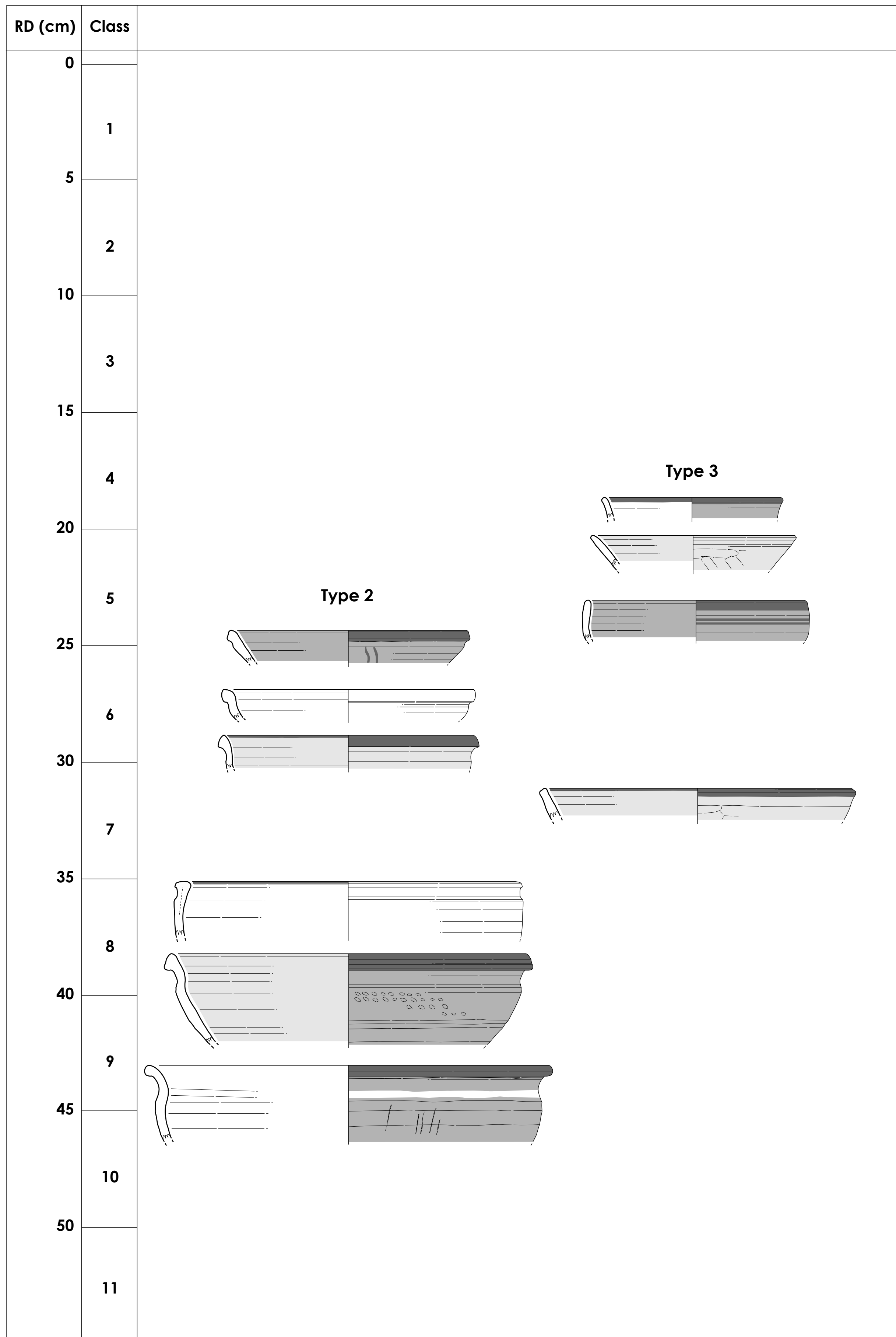


Figure 6.18 RD distribution of the Harappan Bowls with representative specimens (1:6)

neck, but there are a few specimens which show different shapes. In two specimens (nos. 145, 221), the rim-neck portion is quite short. One specimen (no. 355) shows a shallower body.

Eleven specimens are painted in black with a narrow band on the rim. Thirteen specimens are slipped wither in red or white. One specimen (no. 358), a sherd of the lower part of the body, is executed with parallel horizontal narrow grooves on the internal surface near the base.

In regards to the manufacturing technique, there are those which are finished by smoothening with rotation on the whole surface and those which is finished with scraping with rotation on the external surface of the lower part of the body. In one specimen (no. 301), four courses of rope impressions are left on the external surface of the body.

[Type 3]

Type 3 includes those specimens with unique shapes. nine specimens are included in this group. As one of them (no. 917) is a tiny fragment of the rim portion, other eight specimens are described here.

One specimen (no. 50) has a body with a straight profile and a simple rounded rim, measuring 21.6 cm in RD. Whereas the entire internal surface and the external surface of the rim-neck portion are smoothened with rotation, the external surface of the body is finished by smoothening without rotation.

One specimen (no. 112) consists of a body extending in a vertical direction and a simple rim with a ridge on the external side. It is slipped in red on the external surface and is painted with a narrow band on the rim. It measures 19.0 cm in RD. The entire surface is smoothened with rotation.

One specimen (no. 263) has an overall shape similar to that of no. 112, having a rim of a rectangular section and measuring 33.0 cm in RD. It is executed with a white slip on the entire surface and a narrow black band on the rim. The entire internal surface and the external surface of the rim is smoothened with rotation, and the external surface of the body is finished by smoothening without rotation.

One specimen (no. 632) has an gently out-curved neck. The rim is tapered and simply rounded. It is slipped in red on the entire surface. It measures 19.6 cm in RD.

One specimen (no. 346) consists of a shallow lower part of the body, an upper part of the body shortly raised, and a shortly out-curved neck. It measures 27.0 cm in RD. A red slip is intact on the internal surface. The entire surface is finished by smoothening with rotation.

In one specimen (no. 1103), a body seemingly hemispherical in shape and a slightly incurved neck are attested. It measures 20.8 cm in RD. It is executed with a red slip on the entire surface and with narrow black bands on the rim and on the external surface of the body. The entire surface is smoothened with rotation.

One specimen (no. 1104) has a shallow lower part of the body and a slightly inclined upper part of the body and rim-neck. It measures 23.4 cm in RD. It is slipped in red on the entire surface and is painted in black with a relatively wider band on the external side of the rim-neck and with two narrow bands on the external side of the body. The surface is entirely smoothened with rotation.

One specimen (no. 916) is distinguished by a sharp ridge on the body and a shortly out-turned rim, measuring 33.6 cm in RD. It is slipped in red on the entire surface and is painted in black with horizontal bands on the rim and the ridge. It is entirely finished by smoothening with rotation.

Dish

14 specimens were recorded as Dish, among which 16 specimens are intact with a rim portion and one specimen represents only a base portion . They can be classified into the following types based on the rim shape and body shape (Figure 6.19).

Type 1 Having sides opening straight. (n=11)
Type 2 Having a nail-headed rim. (n=1)

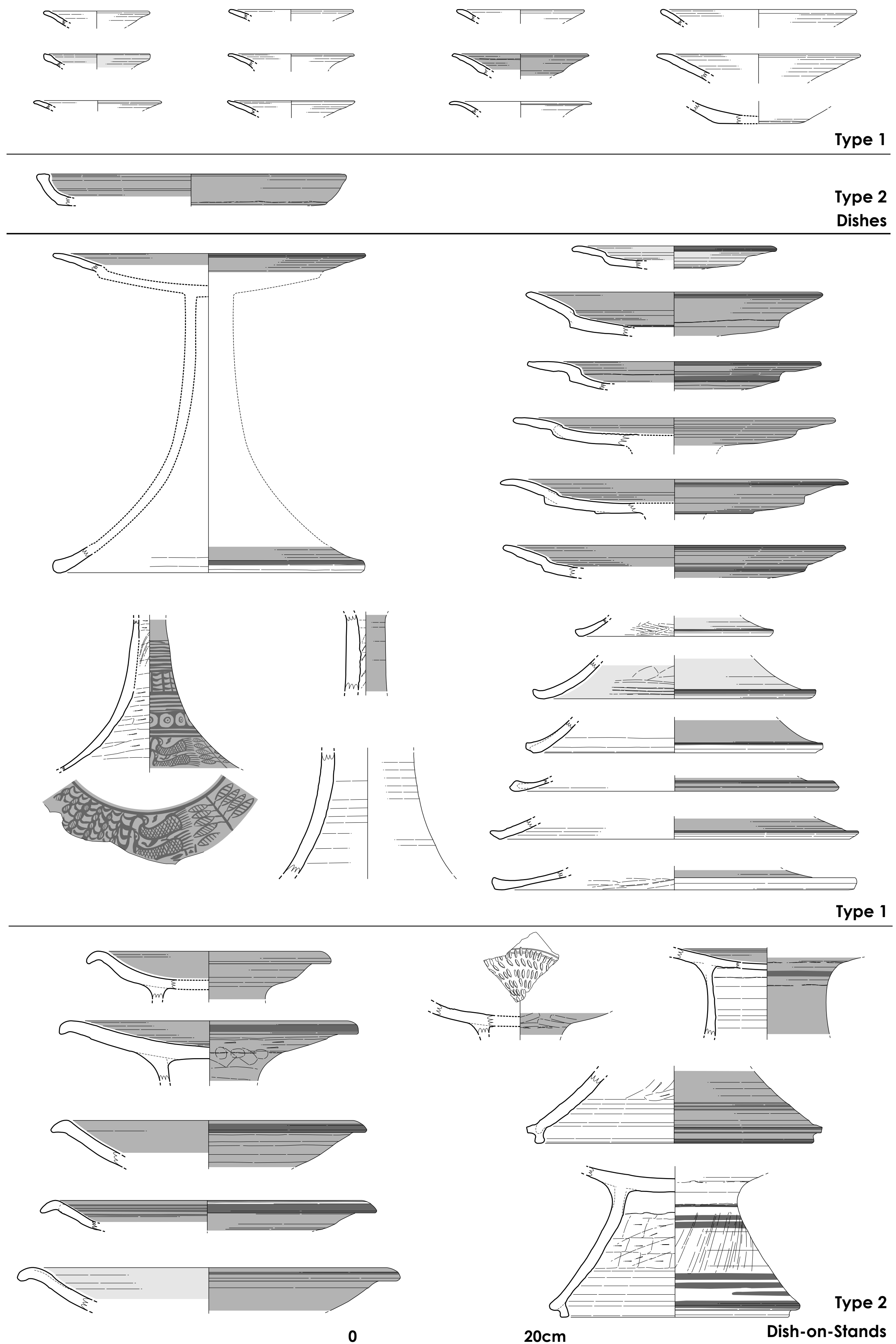


Figure 6.19 Harappan Dishes and Dish-on-Stands (1:6)

Table 6.14 Distribution of RD Classes of the Harappan Dish Type 1

RD class	*Range (cm)*	*no.*
Class 1	0.1 - 5.0	0
Class 2	5.1 - 10.0	0
Class 3	10.1 - 15.0	10
Class 4	15.1 - 20.0	0
Class 5	20.1 - 25.0	2
Class 6	25.1 - 30.0	0
Class 7	30.1 - 35.0	0
Class 8	35.1 - 40.0	0
Class 9	40.1 - 45.0	0
Class 10	45.1 - 50.0	0
Class 11	50.1 -	0

[Type 1]

Type 1 is distinguished by a body and a rim-neck opening straight. The base is probably a flat base. Thirteen specimens were recorded in this type. One base sherd (no. 465) may belong to this type. Twelve specimens are measurable in RD showing a range of 11.2 - 21.6 cm. The RD class 3 is dominant (Table 6.14).

There are a few specimens, in which the rim is slightly out-curved. It is noteworthy that the dishes from the cemetery belong to this type (see Chapter 9). The entire surface is smoothened with rotation. In the base sherd (no. 465), a string-cut marks are observable on the external side of the base.

[Type 2]

Type 2 is distinguished by having a nail-headed rim. Three specimens were identified as this type. They measure 26.0 - 33.0 cm in RD. Two specimens (nos. 53, 634) are similar in overall shape having a shallow body and a shortly raised neck with a nail-headed rim, though the rim shape differs from each other. One specimen (no. 634) which is intact with an entire shape measures 4.0 cm in H and 10.2 cm in BSD. Another specimen (no. 559) has a larger base measuring 28.8 cm. In this specimen, the body extends while slightly incurved. It measures 3.5 cm in H.

In nos. 634 and 59, a slip, either red or white, is applied to the entire surface and a narrow black band is painted on the rim. In no. 634 a horizontal black band is painted on the internal surface as well. no. 559 is slipped in red on the entire surface.

In regards to the manufacturing technique, in nos. 59 and 634 the entire internal surface and the external surface of the upper part of the vessel are smoothened with rotation and the external surface of the lower part of the body is finished by scraping with rotation. No. 559 is finished by smoothening with rotation on the entire surface.

[Type 3]

Type 3 differs from Type 1 in that it has a slightly bulging body and a shortly out-curved neck. This type is represented by only one specimen. It measures 27.0 cm in RD. It is slipped in red on the entire surface and is painted with narrow black bands on the rim. It is entirely finished by smoothening with rotation.

Dish-on-Stand

71 specimens were recorded in the Dish-on-Stands. They can be classified into two types on the basis of the overall shapes (Figure 6.19).

Type 1 Having a shallow dish with a ledge at the juncture between the neck and the body, and a tall pedestal. (n=48)

Type 2 Having a deeper body with a projecting rim shortly drooping, and a low pedestal. (n=21)

[Type 1]

This type is distinguished by a shallow dish with a ledge at the juncture between the neck and the body, and a tall pedestal. Forty-eight specimens are classified in this type, among which 16 specimens are intact with a rim portion, one specimen with a body portion of the dish, 22 specimens with a rim portion of the pedestal, and nine specimens only with a stem portion of the pedestal.

Those with a rim portion show a range of 20.8 - 39.8 cm in RD (Table 6.15, Figure 6.20). Classes 7 and 8 count the largest numbers. In those with a pedestal rim, they measure 20.6 - 38.6 cm in BSD (Table 6.16).

Table 6.15 Distribution of RD Classes of the Harappan Dish-on-Stand Type 1

RD class	***Range (cm)***	***no.***
Class 1	0.1 - 5.0	0
Class 2	5.1 - 10.0	0
Class 3	10.1 - 15.0	0
Class 4	15.1 - 20.0	0
Class 5	20.1 - 25.0	1
Class 6	25.1 - 30.0	0
Class 7	30.1 - 35.0	7
Class 8	35.1 - 40.0	6
Class 9	40.1 - 45.0	1
Class 10	45.1 - 50.0	0
Class 11	50.1 -	0

Table 6.16 Distribution of BSD Classes of the Harappan Dish-on-Stand Type 1

BSD class	***Range (cm)***	***no.***
Class 1	0.1 - 5.0	0
Class 2	5.1 - 10.0	0
Class 3	10.1 - 15.0	0
Class 4	15.1 - 20.0	0
Class 5	20.1 - 25.0	1
Class 6	25.1 - 30.0	5
Class 7	30.1 - 35.0	10
Class 8	35.1 - 40.0	6
Class 9	40.1 - 45.0	0
Class 10	45.1 - 50.0	0
Class 11	50.1 -	0

Table 6.17 Distribution of RD Classes of the Harappan Dish-on-Stand Type 2

RD class	***Range (cm)***	***no.***
Class 1	0.1 - 5.0	0
Class 2	5.1 - 10.0	0
Class 3	10.1 - 15.0	0
Class 4	15.1 - 20.0	0
Class 5	20.1 - 25.0	0
Class 6	25.1 - 30.0	2
Class 7	30.1 - 35.0	4
Class 8	35.1 - 40.0	2
Class 9	40.1 - 45.0	1
Class 10	45.1 - 50.0	0
Class 11	50.1 -	0

Table 6.18 Distribution of BSD Classes of the Harappan Dish-on-Stand Type 2

BSD class	***Range (cm)***	***no.***
Class 1	0.1 - 5.0	0
Class 2	5.1 - 10.0	0
Class 3	10.1 - 15.0	0
Class 4	15.1 - 20.0	1
Class 5	20.1 - 25.0	3
Class 6	25.1 - 30.0	1
Class 7	30.1 - 35.0	0
Class 8	35.1 - 40.0	1
Class 9	40.1 - 45.0	0
Class 10	45.1 - 50.0	0
Class 11	50.1 -	0

They concentrated in Classes 6 - 8 showing diameters similar to those of RD. Those with the uppermost part of the pedestal (two in number) range from 6.6 cm to 8.2 cm in PD.

The pedestal rim shoes a variation of shape which can be classified into the following types.

Base Type 1 Having a shortly out-curved rim. (n=19)

Base Type 2 Having a thickened rim with a round section. (n=3)

Many specimens are slipped either in red or white. Thirteen specimens are painted with a narrow black band on the rim, among which four specimens has a horizontal band on the body. In 15 specimens, the edge of the pedestal rim is painted with a narrow black band.

In regards to the manufacturing technique, the dish is entirely finished by smoothening with rotation. Whereas the external surface of the pedestal is finished by smoothening with rotation, The internal surface is finished by crude scraping without rotation.

[Type 2]

Type 2 is characterized by a deeper dish or bowl with a shortly out-curved and drooping rim, and a low pedestal. Nineteen specimens are classifiable into this type. Among them, nine specimens are intact with a rim portion, six specimens with a pedestal rim, and four specimens only with a body portion of a dish or bowl.

In those with a rim portion, they range from 24.0 cm to 39.0 cm in RD, concentrating in Classes 6 - 9 (Table 6.17, Figure 6.20) and showing a pattern of RD distribution similar to that of Type 1. Those with a pedestal rim show a range of 18.4 - 39.6 cm in BSD (Table 6.18). It is not clear whether one specimen

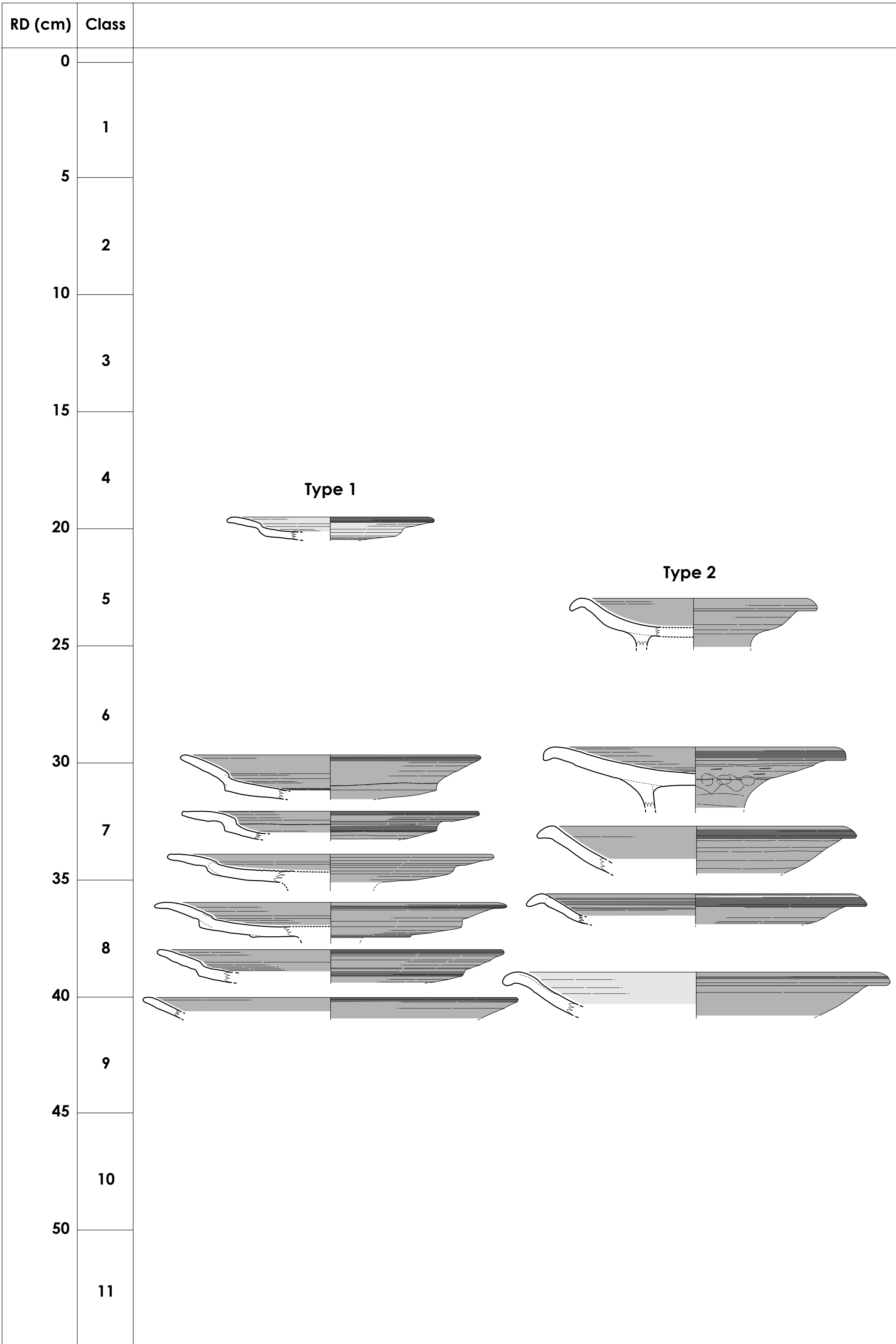


Figure 6.20 RD distribution of the Harappan Dish-on-Stands with representative specimens (1:6)

classified in the PD class 4 is accompanied with a dish of Type 2 or not.

The pedestal rim shape can be classified into the following types.

Base Type 1 Having a flange with a rectangular section on the external side. (n=5)
Base Type 2 Having a rim shortly projecting upwards. (n=1)

Many specimens of the dish are slipped in red (11 in number), among which six specimens are painted with a narrow black band and three specimens with parallel horizontal bands over the rim and body. In those of the pedestal portion, four specimens are painted with a narrow black band on the rim projection, and three specimens are executed with parallel horizontal bands on the external surface. In one specimen (no. 759), concentric grooves are made on the internal side of the base of the dish and in another specimen (no. 560) rows of incised dots are arranged in a radiating pattern.

In regards to the manufacturing technique, the dish portion is either smoothened with rotation on the entire surface or is finished with scraping with rotation on the external surface of the lower part of the body. In the pedestal portion, the entire external surface and the lower part of the internal surface are smoothened with rotation, and the upper part of the internal surface is finished by scraping without rotation. In one specimen (no. 373), a series of vertical impression of some tool can be observed on the external surface.

5.2 Non-Harappan painted pottery

Pot

398 specimens were recorded in the Non-Harappan Painted Pot, including those from surface. Among them 350 specimens are intact with a rim portion and 48 specimens are body sherds or base sherds.

Table 6.19 Distribution of RD Classes of the Non-Harappan Pot

RD class	*Range (cm)*	*n*
Class 1	0.1 - 5.0	1
Class 2	5.1 - 10.0	40
Class 3	10.1 - 15.0	177
Class 4	15.1 - 20.0	94
Class 5	20.1 - 25.0	24
Class 6	25.1 - 30.0	9
Class 7	30.1 - 35.0	3
Class 8	35.1 - 40.0	2
Class 9	40.1 - 45.0	0
Class 10	45.1 - 50.0	0
Class 11	50.1 -	0

Table 6.20 Distribution of NH/RD Classes of the Non-Harappan Pot

NH/RD	*Range*	*no.*
Class 1	- 0.10	32
Class 2	0.11 - 0.20	136
Class 3	0.21 - 0.30	51
Class 4	0.31 - 0.40	18
Class 5	0.41-	4

Table 6.21 Distribution of MRD/ND Classes of the Non-Harappan Pot

MRD/ND	*Range*	*no.*
Class 1	- 1.0	2
Class 2	1.01 - 1.10	89
Class 3	1.11 - 1.20	123
Class 4	1.21 - 1.30	88
Class 5	1.31 - 1.40	19
Class 6	1.41 - 1.50	7
Class 7	1.51 -	5

Those with a rim portion range from 4.05 cm to 36.8 cm in RD, concentrating to Classes 2 - 5, among which Class 3 is dominant (Table 6.19). This suggests that the Non-Harappan Painted Pot tends to be relatively smaller in size.

The number of specimens which are measurable in NH count 224 showing a range of 1.0 - 6.0 cm. The NH/RD index varies from 0.04 to 0.52 (Table 6.20, Figure 6.21). Class 2 outnumbers others, followed by Class 3 and 1, indicating that those with a taller neck are limited in number..

The MRD/ND index have a range of 1.0 to 1.56. Class 3 is predominant followed by Classes 2 and 4 (Table 6.21, Figure 6.22). It can be observed that the

NH:RD	Class	
0.05		
	1	
0.10		
	2	
0.20		
	3	
0.30		
	4	
0.40		
	5	

Figure 6.21 NH/RD distribution of the Non-Harappan Pots with representative specimens (1:6)

MRD/ND	Class
	1
1.0	
	2
1.10	
	3
1.20	
	4
1.30	
	5
1.40	
	6
1.50	
	7

Figure 6.22 MRD/ND distribution of the Non-Harappan Pots with representative specimens (1:6)

Table 6.22 Relations between NH/RD Classes and MRD/ND Classes

		ND/RD				
		1	**2**	**3**	**4**	**5**
MRD/ND	**1**	1	1	0	0	0
	2	20	53	6	0	0
	3	8	70	14	7	0
	4	3	11	21	16	3
	5	0	1	8	1	1
	6	0	0	1	3	0
	7	0	0	1	1	0

Non-Harappan Painted pot are less outcurved in neck.

Table 6.22 shows the relations between the NH/RD index and the MRD/ND index, suggesting that taller the neck becomes, more outcurved it is.

The rim shape can be classified into the following types.

Rim Type 1 Having a simple rounded rim. (n=196)
Rim Type 2 Having a shortly projecting rim. (n=33)
Rim Type 4 Having a prominently projecting rim. (n=1)
Rim Type 3 Having a rim with a flat face on the external side, sometimes shallowly grooved. (n=137)
Rim Type 5 Having a projecting rim in a tapering section. (n=2)

In regards to the body portion, those with an entire body are limited in number. Those specimens which are better intact with the body portion show a globular shape having a bulging shoulder and a elliptical shape with a less bulging shoulder. The former body shape can be exemplified by nos. 710, 709, 764, 655, 537, 574, 646, 485, 486, etc. This type of body shape can be seen in various RD size. The latter body shape can be illustrated by 790, 425, 495, 316, etc.

The base of the Non-Harappan Painted Pot is distinguished by a round base with a ring. The centre of the base protrudes the edge of the ring. No flat base was identified in the Non-Harappan Painted Pot.

In regards to the manufacturing technique, the Non-Harappan Painted Pot is distinctively represented by smoothening with rotation on the rim-neck portion and non-rotational smoothening or scraping on the body. The impression of the edge of a hard tool which had a straight edge can be exclusively obeserved on the internal surface of the body. The round base with a ring is modelled by jointing a ring to the round base.

The decoration feature of the Non-Harappan Painted Pot is distinguished by black bands. The black bands show variation in width and arrangements, which can be broadly classified into those with a wider band on the rim-neck, in some cases down to the body portion, and those with a narrow band on the rim and parallel horizontal bands on the body. These bands are accompanied with some additional motifs in some specimens.

The motifs on the body can be classified into the following types (Figures 6.23 and 6.24).

Motif 1 Animal motif.
Motif 2 Horn-like motif consisting of curvi-linear strokes.
Motif 3 Large loops.
Motif 4 Concentric semicircles.
Motif 5 Parallel vertical strokes.
Motif 6 Parallel oblique strokes.
Motif 7 Compartment motif with an oblique chequerboard pattern.
Motif 8 Oblique chequerboard pattern.
Motif 9 Small loops

Motif 10 Wavy band with dots.
Motif 11 A series of solid semicircles.
Motif 12 A pair of whirls.
Motif 13 Other unique motifs.

Motif 1 is represented by only one specimen, in which a head and a wing seemingly of a bird (no. 992). This is a sherd of a shoulder. The head consists of a eye represented by a dot in a circle. Over the head and wing are added with hatches.

Motif 2 and Motif 3 are in some specimens difficult to be distinguished, but in the case of horn-like motifs, the curvilinear stroke is whirling or is accomapnied with hatches on the end. In one specimen (no. 688), a pair of horn-like curvilinear strokes is painted in a horizontal register which is demarcated by horizontal bands on the body. The external ends of the curviliear strokes are added with hatches. Another specimen (no. 504) shows a similar motif. In one specimen which has a similar painting, a #-shape is placed bwteen the curvilinear strokes. One specimen (no. 691) which is not well-preserved has a pair of juxtaposed curvilinear strokes, the left stroke of which is whirling and is added with hatches on the end. In one specimen (no. 690), a X-shape consisting of double strokes is placed between the curvilinear strokes. In one specimen (no. 513), a pair of double horn-like strokes extends on either side of a central portion, accompanied with hatches on the external sides. In one specimen (no. 511), a hatched triangle with three vertical wavy strokes is depicted between horn-like strokes. One specimen (no. 514) shows a hatched oblong shape with horn-like curvilinear strokes on both sides. In one specimen (no. 445), curvilinear wide bands with hatches are intact in two in a narrow horizontal register demarcated by parallel horizontal bands, having different directions.

Motif 3 is distinguished by large loops which are arranged in a horizontal register on the shoulder. Five or six loops may be arranged around the body. In one specimen (no. 655), hatches and parallel oblique strokes are added to loops.

Motif 4 is juxtaposed concentric semi circles in a horizontal register on the shoulder.

Motif 5 or a set of parallel vertical strokes is painted either on the internal side of the rim or on the external side of the body. Those with Motif 5 on the internal side of the rim is a variant of Motifs 9 and 11 which are similarly painted on the internal side of the rim. In those with Motif 5 on the external side of the body, a set of three or four parallel vertical strokes are arranged in a horizontal register on the shoulder, especially in small pots.

Motif 6 or a set of parallel oblique strokes is arranged in a horizontal register on the shoulder, being a variant of Motif 5 on the external side of the body. The sets of oblique strokes are alternately arranged in different directions.

Motif 7 is a triangular or rectangular compartment with a oblique chequerboard pattern. The triangular compartment is more in number. Two types of arrangements of triangles can be observed, i.e. those with juxtaposed inverted triangles (no. 80) and those with two horizotal rows of triangles which are formed by juxtaposed X-shape strokes (no. 507). An example of a rectangular compartment is no. 489, in which rectangular compartments are likely to be arranged at intervals. In one specimen (no. 511), a triangle accompanies with a horn-like motif.

Motif 8 or an oblique chequerboard pattern in filled in a horizotal register on the shoulder (nos. 764, 814).

Motif 9 or a wavy band is painted either on the internal side of the rim below a rim band or below horizontal bands on the external side of the body. In the former arrangement, several loops form a set arranged at intervals in some specimens.

Motif 10 or a series of loops with dots is represented by only one specimen, in which it is arranged below a narrow horizontal register with an oblique chequerboard pattern.

Motif 11 or juxtaposed solid semicircles is painted on the internal side of the rim below a rim band in a way similar to Motifs 5 and 9.



Figure 6.23 Painted motifs and patterns of the Non-Harappan pottery with representative specimens
1: Animal (bird) motif, 2-4 Horn-like motif, 5-6: Parallel strokes, 7-8: Large semicircles



Figure 6.24 Painted motifs and patterns of the Non-Harappan pottery with representative specimens
1: Loops, 2-3: Hatched triangles, 4: hatched register with dots-in-loops, 5: Spiral motif, 6: Concentric semi-circles with a X-shaped motif, 7-8: Reserved slip technique

Motif 12 or a pair of whirls is painted in a horizontal register on the shoulder. In one specimen (no. 82), it is arranged at four directions.

In Motif 13 are included other unique motifs. In one specimen (no. 245), parallel vertical strokes are painted under two parallel horizontal bands. In one specimen (no. 508), a irregular wavy band is painted in a horizotal register demarcated by two parallel horizontal bands. One specimen (no. 502) shows pararell oblique strokes accompanied with an oblique band. In one specimen (no. 497), a concentric semicircles, two sets of hatched parallel oblique strokes arranged in a X-shape, and a motif consisting of a horizontal stroke and a set of parallel vertical strokes arranged in a crisscross are painted on the shoulder. In one specimen (no. 517), the painting is comprised by curvilinear strokes and oblique chequerboard patterns are filled in spaces fomred by these curvilinear strokes. In one specimen (no. 589), loops of triple strokes hatched on the internal side is accompanied with a X-shape of double strokes. In a specimen of a body sherd, a horizontal register with a chequerboard pattern and a hatched circle are connected by a three parallel vertical strokes.

In addition to the ordinary black painting, the reserved slip technique were observed in seven specimens (no. 17, 129, 246, 244, 336, 349 and 537). In no. 17 the reserved slip technique is applied to a white slipped surface. In the others examples it is executed on a black band. The pattern consists of concentric semicircles and parallel wavy bands.

Bowl

In all, 169 specimens were recoded in the Non-Harappan Bowls. They can be classified into the following types.

Type 1 Out-curved Rim Bowl. (n=140)
Type 2 In curved Rim Bowl. (n=2)
Type 3 Hemispherical Bowl. (n=17)
Type 4 Having a shallow body and a slightly out-curved neck. (n=5)

[Type 1]

Type 1 is distinguished by a hemispherical body and a shortly out-curved neck. One hundred forty specimens were recorded in this type. they have a wide range of 9.2 - 50.0 cm in RD, distributing quite evenly over Classes 3 - 10 (Table 6.23, Figure 6.25).

The rim shape can be classified into the following types.

Rim Type 1 Having a simple rounded rim. (n=55)
Rim Type 2 Having a rim with a rectangular section, in some cases shallowly grooved. (n=77).
Rim Type 3 Having a rim in a tapering shape. (n=1)

The neck shape can be divided into the following types.

Neck Type 1 Having a less out-curved neck. (n=62)
Neck Type 2 Having a shortly out-curved neck. (n=70)

Table 6.24 shows the relations between the Rim Types and the Neck Types. It is indicated that Rim Type 1 tends to have a less out-curved neck and Rim Type 2 tend to have a shortly-out-curved neck.

In Table 6.25, the relations between the Rim Types + Neck Types and the RD classes. This suggests that Rim Type 1 + Neck Type 1 has a tendency to concentrate in the smaller sizes and Rim Type 2 + Neck Type 2 has a concentration in larger sizes.

In regards to the manufaturing technique, the rim-neck portion is smoothened with rotation and the body is finished by smoothening or scraping without rotation. In larger specimens, there are a number of examples which are executed with thin slurry on the external surface.

The decoration consists commonly of a red or white slip and a narrow black band on the rim. Some specimens are painted with double or triple loops on

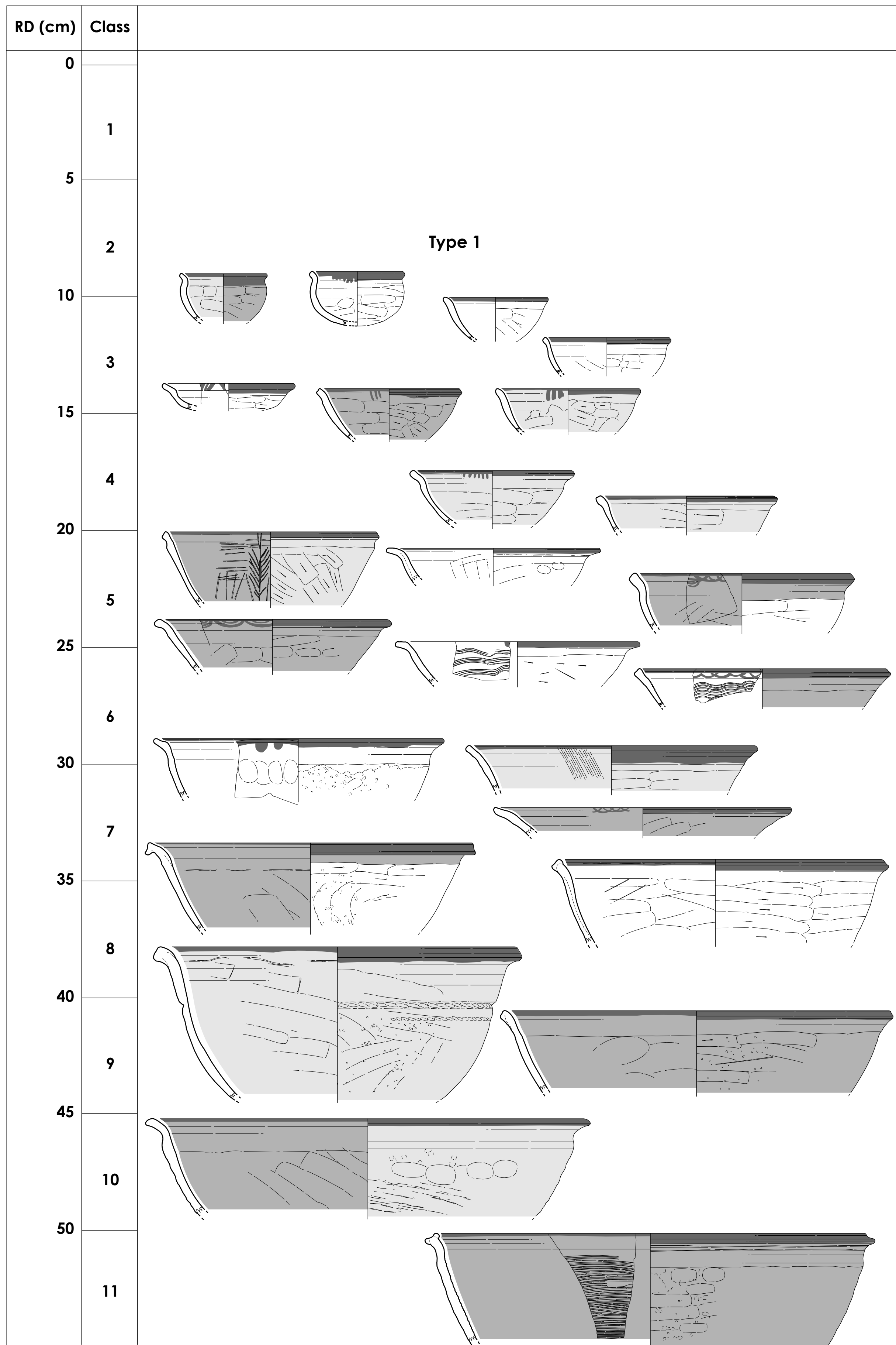


Figure 6.25 RD distribution of the Non-Harappan Bowls with representative specimens (1:6)

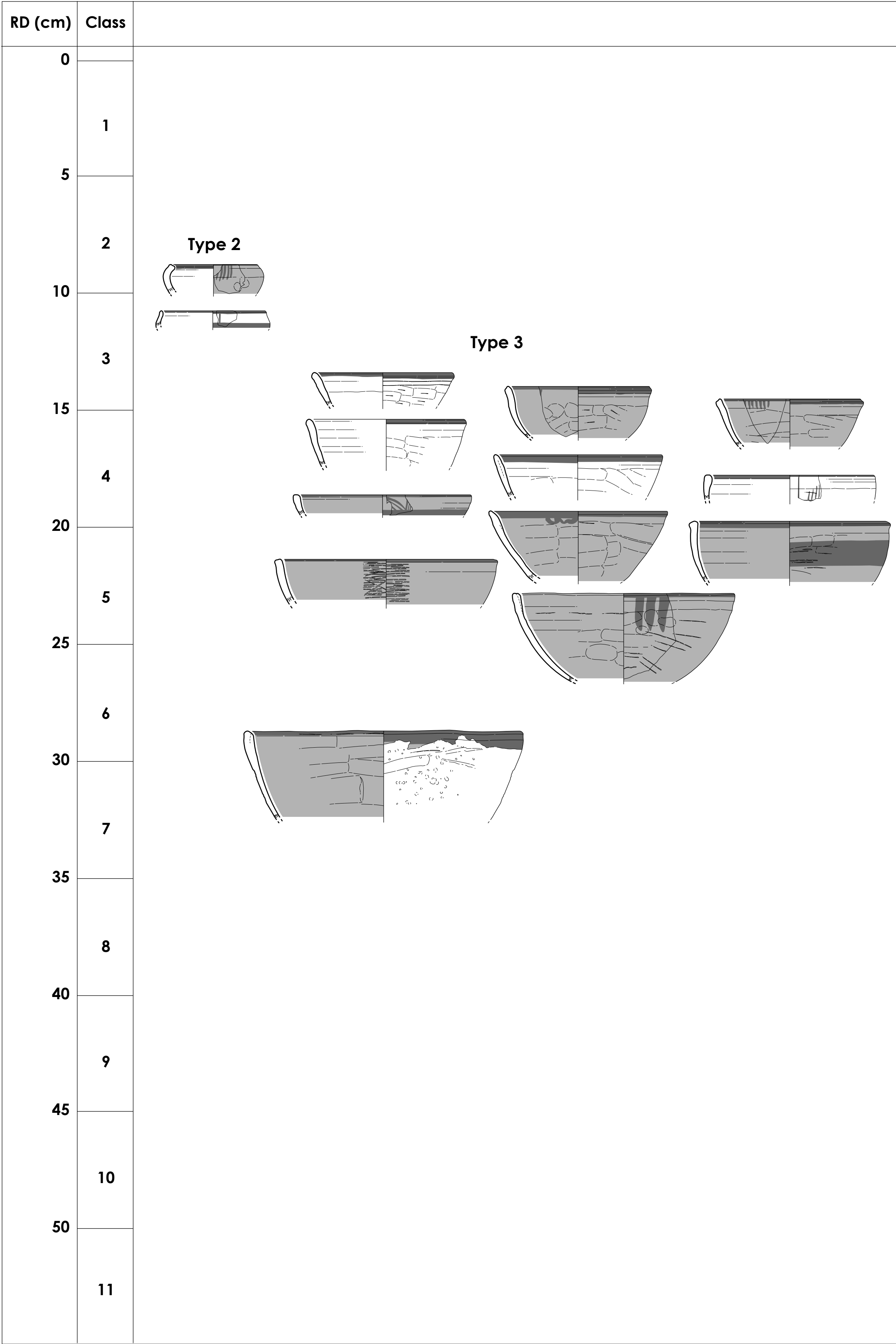


Figure 6.26 RD distribution of the Non-Harappan Bowls with representative specimens (1:6)

the internal side of the rim-neck portion.

[Type 2]

This type of Bowl is represented by only two specimens. They measure 9.2 cm and 11.0 cm in RD respectively (Figure 6.26). One specimen (no. 998) has a rim of a rectangular section with a narrow groove on the external side of the rim. It is painted with a narrow black band on the rim and parallell vertical strokes on the external side of the rim-neck. Another specimen (no. 999) has a horizontal register demarcated by two horizontal bands and filled with parallel vertical strokes.

In regards to the manufacturing technique, the rim-neck portion is smoothened with rotation and the body is finished by smoothening without rotation.

Table 6.23 Distribution of RD Classes of the Non-Harappan Bowl Type 1

RD	***Range (cm)***	***no.***
Class 1	0.1 - 5.0	0
Class 2	5.1 - 10.0	2
Class 3	10.1 - 15.0	15
Class 4	15.1 - 20.0	21
Class 5	20.1 - 25.0	16
Class 6	25.1 - 30.0	15
Class 7	30.1 - 35.0	20
Class 8	35.1 - 40.0	18
Class 9	40.1 - 45.0	11
Class 10	45.1 - 50.0	9
Class 11	50.1 -	0

Table 6.24 Relations between Rim Types and Neck Types of the Non-Harappan Bowl Type 1

		Rim Type		
		1	***2***	***3***
Neck Type	***1***	34	24	0
	2	18	49	1

[Type 3]

This type of Bowl cout 15 specimens in number. In some specimens, the overall shape is similar to Type 1 with Rim Type 1 and Neck Type 1.

They show a range of 14.8 - 29.1 cm in RD concentrating in Classes 3 - 5 (Table 6.26, Figure 6.26).

The rim shape can be classified into the following types.

Rim Type 1 Having a simple rounded rim. (n=8)

Rim Type 2 Having a rim of a rectangular section, in some cases narrowly grooved on the external side. (n=6)

Rim Type 3 Having a slightly thickened rim. (n=1)

All specimens are painted with a narrow black band on the rim. In one specimen (no. 164), a narrow black band is painted on the external side of the body as well. One specimen (no. 340) is painted in black with juxtaposed solid semi-circles on the internal side of the rim-neck. Two specimens (nos. 704, 591) are painted with short parallel vertical strokes on the internal side of the rim. In one specimen (no. 936), three parallel vertical strokes are painted on the external side of the rim-neck. One specimen (no. 705) has a wider band on the external side of the upper part of the vessel.

In regards to the manufacturing technique, the rim-neck portion is smoothened with rotation, and the rest is finished by smoothening or scraping without rotation. One specimen (no. 173) is executed with streak burnishing on the entire surface.

[Type 4]

Type 4 is distinguished by a shallow body and a slightly out-curved neck. Only three specimens were identified. They measure 7.8 - 9.6 cm in RD.

Two specimens (nos. 833, 832) are identical in shape, having a shallow body with a shallow carination or a low ridge and a shortly out-curved neck. In A1128, the external surface of the upper part of the body is painted with a black band and in A1130 narrow black bands are painted on the rim and the external surface of the body. The upper part of the vessel is smoothened with rotation and the lower part of the vessel is finished by scraping without rotation.

Another specimen (no. 831) has a hemispherical

Table 6.25 Relations between Rim Types/Neck Types and RD Classes

		Rim Type 1 + Neck Type 1	Rim Type 1 + Neck Type 2	Rim Type 2 + Neck Type 1	Rim Type 2 + Neck Type 2
RD	**1**	0	0	0	0
	2	0	1	0	1
	3	8	2	5	0
	4	13	3	3	2
	5	4	4	3	5
	6	5	3	5	2
	7	3	4	3	10
	8	1	0	2	15
	9	0	0	3	8
	10	0	1	0	6
	11	0	0	0	0

Table 6.26 Distribution of RD Classes of the Non-Harappan Bowl Type 3

RD	Range (cm)	no.
Class 1	0.1 - 5.0	0
Class 2	5.1 - 10.0	0
Class 3	10.1 - 15.0	3
Class 4	15.1 - 20.0	7
Class 5	20.1 - 25.0	4
Class 6	25.1 - 30.0	1
Class 7	30.1 - 35.0	0
Class 8	35.1 - 40.0	0
Class 9	40.1 - 45.0	0
Class 10	45.1 - 50.0	0
Class 11	50.1 -	0

body and a shortly out-curved neck. The base is most likely round. The external surface of the upper part of the vessel is painted with a wide black band. The rim-neck portion is smoothened with rotation and the body is finished by smoothening without rotation.

Pedestalled Pot or Pedestalled Bowl

Eight specimens were identified as Pedestalled Pot or Pedestalled Bowl (Figure 6.27). They are all sherds of the pedestal portion. They ranges from 7.5 cm to 12.6 cm in BSD, from 4.0 cm to 13.0 cm in PD, and from 2.0 cm to 3.0 cm in PH. As shown in PD, one specimen has a narrow stem and others are distinguished by wide and low pedestal. They are painted with narrow black bands on the pedestal rim and at the juncture between the Pot or Bowl portion and the pedestal. In one specimen (no. 509), a motif consisting of a pair of parallel vertical strokes with hatches on the external side is painted at intervals on the external side of the pedestal.

5.3 Grey ware

Grey ware was identified in 56 specimens. They can be classified into the Pot and Bowl, Dish or Dish-on-Stand (Figure 6.28).

Pot

Except for one specimen, the entire shape of the GW Pot is uncertain as only rim or body sherds were identified.

One specimen (no. 523), the entire shape of which is intact, is a Pedestalled Pot. This specimen was found in fragments but they were refitted to show the entire shape. It consists of a globular body and a gently out-curved neck with a simple rounded rim. A wide and low pedestal is jointed to the round base of the Pot. The rim-neck portion is smoothened with rotation, but traces of jointing the neck to the body can be observed on the internal side of the shoulder. The internal surface of the rim-neck and the entire external surface are slipped and finished by streak burnishing. It measures 10.3 cm in RD, 2.7 cm in NH, 15.1 cm in BD and 14.7 cm in H.

The following descriptions are made on sherds.

One specimen (no. 874) is likely to be a small Pot having a rim of 4.7 cm in RD. The rim is slightly projecting. The surface is entirely finished by streak

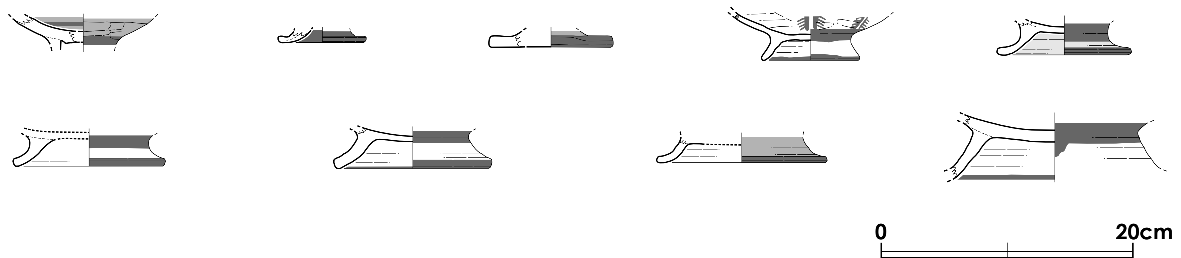


Figure 6.27 Harappan Dishes and Dish-on-Stands (1:6)

burnishing.

One specimen (no. 135) consists of a globular body and a straight rim-neck, measuring 8.4 cm in RD. A trace of luting can be observed on the internal surface. The surface is entirely burnished.

One specimen (no. 964) is a rim-neck sherd similar to 7664, having an prominently out-curved neck. It measures 10.5 cm in RD. The surface is finished by burnishing.

One specimen (no. 972) is a rim-neck sherd having a shortly out-curved neck. The rim has a rectangular section which is grooved on the external side. It measures 15.1 cm in RD. The surface is burnished.

One specimen (no. 23) has an out-curved neck with a slightly thickened rim which is shallowly grooved on the external side. It measures 15.4 cm in RD.

One specimen (no. 104) is a body sherd of the shoulder, measuring 11.4 cm in diameter at the juncture between the neck and the body. The surface is smoothened with rotation and then burnished on the external side.

One sherd (no. 22) is intact with the neck and the upper part of the body showing a globular body. It measures 10.0 cm in BD. Traces of luting can be observed on the internal surface. The surface is entirely smoothened without totation as finger impressions are left on the internal surface. The external surface is finished by burnishing.

One specimen (no. 524) is a sherd of the shoulder portion showing traces of luting on the internal surafce which were left at the time of jointing the neck portion to the body. A blackish slip is applied to the surface, follwed by burnishing.

One specimen (no. 105) is a body sherd having a carination or ridge. It measures 14.0 cm in BD. The entire internal surface and the upper part of the external surface are smoothened with rotation and the lower part of the external surface is finished by smoothening without rotation.

Bowl, Dish and Dish-on-Stand

The Bowl, Dish and Dish-on-Stand are exclusively described since it is difficult to distinguish them on sherds. They can be classified into the following types based on the rim and body shapes.

Type 1 Having an out-turned rim-neck. (n=7)
Type 2 Having a projecting rim. (n=6)
Type 3 Having a shallow hemispherical body. (n=2)
Type 4 Other unique shapes. (n=8)

[Type 1]

Seven specimens were recorded in this type, showing a range of 15.4 - 31.0 cm in RD. In those itact with the body portion, shallow (nos. 1064, 457) and deeper (nos. 107, 165, 456, 108) shapes are observable. Among these, no. 1064 may be a Dish-on-Stand. All specimens have a rim with a rectangular section. The surface is entirely burnished after smoothening with rotation.

[Type 2]

Type 2 is represented by four specimens having a

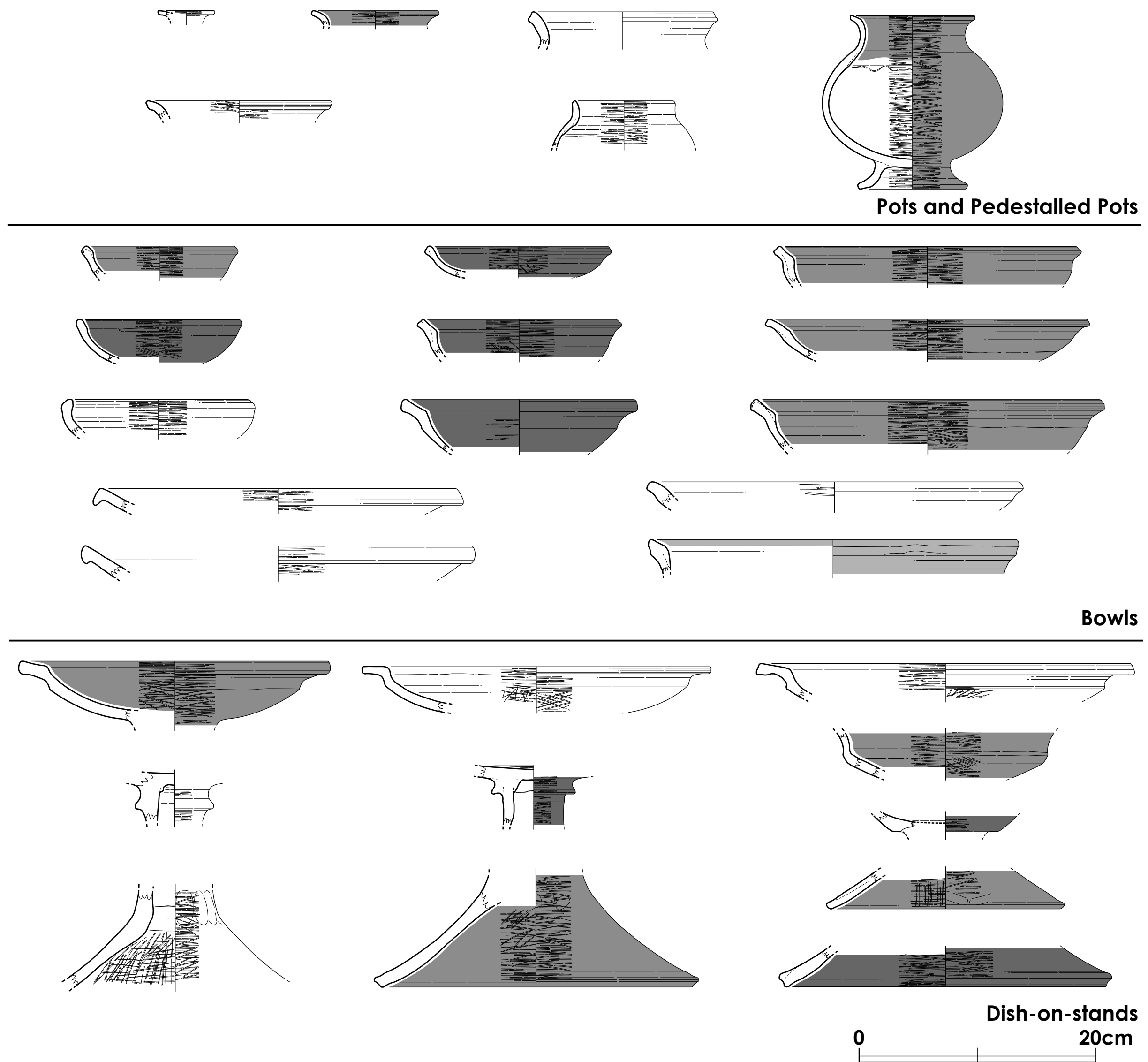


Figure 6.28 Representative specimens of the Grey ware (1:6)

range of 30.0 - 45.0 cm in RD. The surface is finished by burnishing after smoothening with rotation.

[Type 3]

Type 3 is identified in two specimens which measure 12.6 - 13.6 cm in RD. The rim is slightly thickened and rounded. The surface is entirely smoothened.

[Type 4]

Type 4 includes those with an unique shapes.

One specimen (no. 136) has a overall shape similar to Type 3 but has an incurved rim-neck. It measures 15.0 cm in RD. The surface is entirely burnished after smoothening with rotation.

One specimen (no. 343) has a shallow body with a thickened and projecting rim with a triangular section. It measures 15.1 cm in RD. The surface is entirely smoothened with rotation and slipped in blackish colour, followed by burnishing.

One specimen (no. 411) has a globular body and a out-curved neck, probably representing a short-necked Bowl. It measures 8.5 cm in BD. The surface is entirely finished by burnishing.

One specimen (no. 458) is a sherd only of a rim portion, probably having a shallow body. It measures 30.8 cm in RD. The rim is slightly out-curved.

One specimen (no. 116) is a base sherd having a flat base which is similar in shape to that of the Harappan flat base. It measures 8.6 cm in BSD. The



Figure 6.29-1 Potsherds with post-firing graffiti

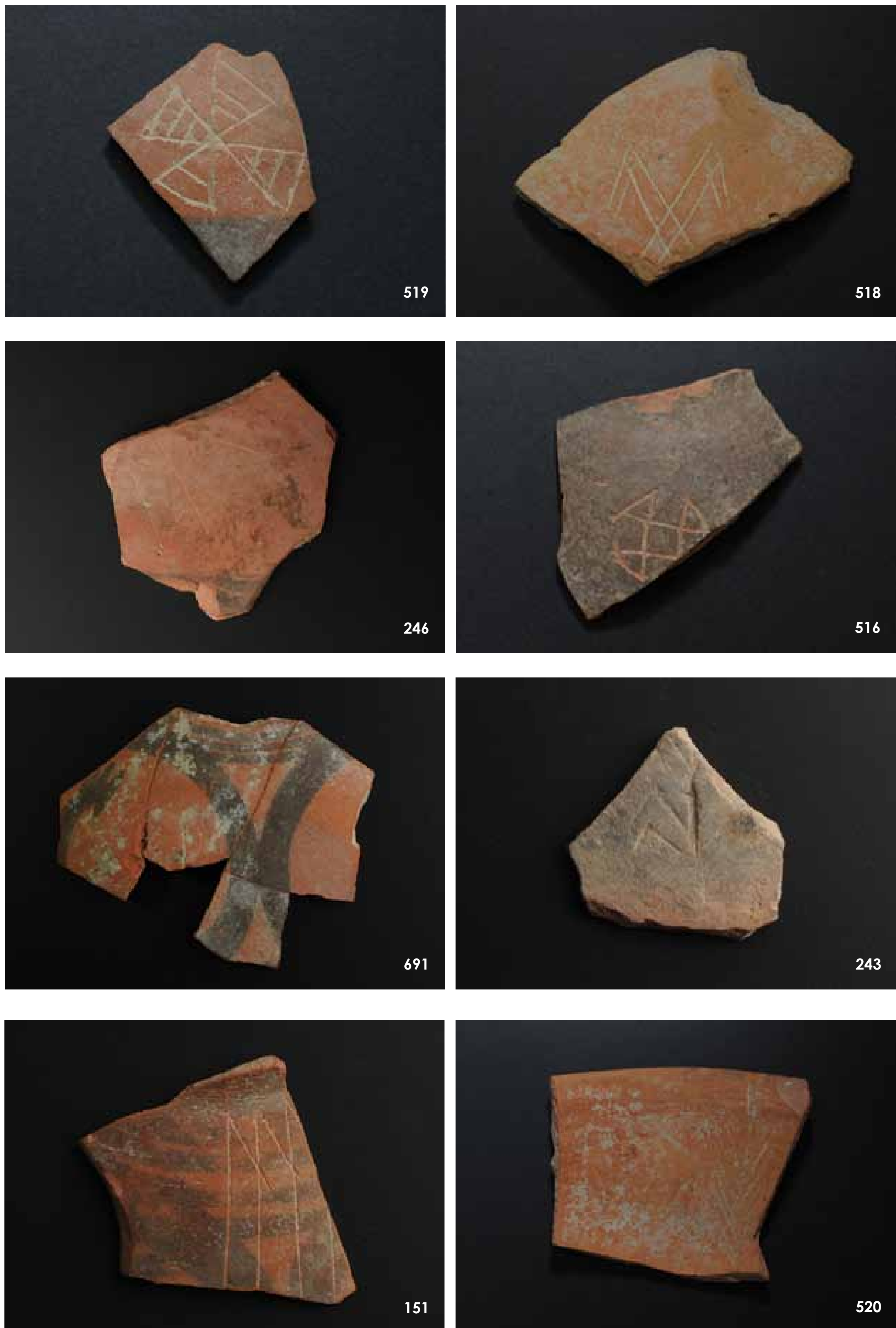


Figure 6.29-2 Potsherds with post-firing graffiti

surface is entirely smoothened with rotation and is burnished on the external surface.

6 POST-FIRING GRAFFITI ON POTSHERDS

29 specimens with post-firing graffiti were found in the excavations (Figure 29). Stylistically 10 specimens belong to the Harappan pottery and 19 specimens represent the Non-Harappan pottery. Most of them do not retain the entire shape of the graffiti due to their fragmentary condition. Therefore, only a few specimens can be identified with their graffiti.

Among the Harappan sherds, the graffiti are executed on the rim only in two specimen (nos. 279, 459). In 279, they consist of three parallel short strokes of incised lines. No. 459 exhibits inverted W-shaped graffiti on the internal side of the rim. In no. 420 a trident-shaped graffiti can be observed. No 287 is noteworthy in that a lower of an anthropomorphic figure is depicted by scratch. In no. 860, the graffiti consist of parallel oblique lines in a triangular shape with a vertical line in its centre. In one specimen of the Dish-on-Stand (no. 685) are found irregular scratches on the internal side of the neck. In no. 918 which is probably a base fragment of a Bowl has graffiti on the internal side of the base, though it seems irregular in shape.

In the Non-Harappan sherds, seven specimens (nos. 59, 116, 161, 335, 646, 971 and 984) are engraved with some signs on the rim or on the internal side of the rim. In six specimens two or three parallel engraved lines are observed, while in one specimen (no. 116) a trident-shaped sign is found. Except for no. 161 which is a Bowl, all specimens are Pots.

12 specimens are executed with graffiti on the body portion. In no. 151, graffiti composed of oblique strokes are found on the shoulder. Graffiti in no. 243 may be some figurative motif. No. 246 exhibits a star-like sign on the shoulder. A fair amount of scratches in irregular directions can be observed in no. 691. In no. 516, a sign like four leaf flower is intact with its entire shape. No. 519 shows a propeller-shaped motif with hatches. No. 515 probably represents a pair of some animals in a very stylistic depiction. No. 520 is distinguished by a large tree-shaped motif on its internal side. A part of some sign is intact in nos. 518, 588, 502 and 993.

7 STRATIGRAPHIC OCCURENCES OF CERAMIC STYLES AND TYPES

In regards to the Settlement Area, 1220 specimens of potsherds were documented from various context in order to cover chronological and spatial variation of pottery. Among them, 29 specimens were from surface collections and 1191 specimens were from the excavations.

Stylistically, 476 specimens belong to the Harappan pottery (three from surface and 473 from excavations), 716 specimens to the Non-Harappan pottery (26 specimens from surface and 690 specimens from excavations) and 28 specimens to the Historical pottery (all specimens from excavations).

Table 6.27 shows the area-wise distribution of the documented specimens. Since those from Index Trenches 1C11 and 1D5 among six Index Trenches were extensively documented, the number of specimens from the Central Area are the largest. In regards to the North Area including Index Trench 3, the documentation was focused on those from the lower part (Phase 2 and 3) of the whole stratigraphy of Index Trench 3. In the North Extension, those from the lower part (Phase 2) were subjected to extensive documentations. In Northwest Area, those from Trench 3U17 were documented. Those from the East Area and West Area were not chosen for documentation due to the limitation of time, though 65 specimens from the East Area were documented. In addition to these, those found in a kiln which was found about 70 m to the east of the Central Area were selected for documentation.

Table 6.27 Area- and phase-wide numbers of recorded potsherds from the Settlement Area

Central Area	***Total***	***Harappan***	***Non-Harappan***	***Historical***
Historical	28	0	0	28
Phase 5	204	58	146	0
Phase 4	107	52	55	0
Phase 3	48	18	30	0
Phase 2	195	98	97	0
Phase 1	23	10	13	0
Uncertain	7	3	4	0
Total	612	239	345	28

East Area	***Total***	***Harappan***	***Non-Harappan***	***Historical***
Historical	0	0	0	0
Phase 5	0	0	0	0
Phase 4	65	27	38	0
Phase 3	0	0	0	0
Phase 2	0	0	0	0
Phase 1	0	0	0	0
Uncertain	0	0	0	0
Total	65	27	38	0

Northwest Area	***Total***	***Harappan***	***Non-Harappan***	***Historical***
Historical	0	0	0	0
Phase 5	0	0	0	0
Phase 4	0	0	0	0
Phase 3	0	0	0	0
Phase 2	135	50	85	0
Phase 1	0	0	0	0
Uncertain	7	1	6	0
Total	142	51	91	0

North Extension	***Total***	***Harappan***	***Non-Harappan***	***Historical***
Historical	0	0	0	0
Phase 5	0	0	0	0
Phase 4	2	1	1	0
Phase 3	2	1	1	0
Phase 2	126	54	72	0
Phase 1	0	0	0	0
Uncertain	0	0	0	0
Total	130	56	74	0

North Area	***Total***	***Harappan***	***Non-Harappan***	***Historical***
Historical	0	0	0	0
Phase 5	0	0	0	0
Phase 4				
Phase 3				
Phase 2				
Phase 1				
Uncertain	0	0	0	0
Total	0	0	0	0

Kiln Area	***Total***	***Harappan***	***Non-Harappan***	***Historical***
Total	32	19	13	0

Table 6.28 Area- and phase-wide numbers of recorded potsherds from the Settlement Area (Index Trenches 1C11, 1D5 and 2D9)

1C11	Total	Harappan	Non-Harappan	Historical
Phase 5	7	0	7	0
Phase 4	42	13	23	6
Phase 3	35	7	22	6
Phase 2	94	33	61	0
Phase 1	23	10	13	0
Uncertain	7	3	4	0
Total	208	66	130	12

1D5	Total	Harappan	Non-Harappan	Historical
Phase 5	5	2	3	0
Phase 4	71	39	32	0
Phase 3	19	11	8	0
Phase 2	99	64	35	0
Phase 1	0	0	0	0
Uncertain	0	0	0	0
Total	194	116	78	0

2D9	Total	Harappan	Non-Harappan	Historical
Phase 5	0	0	0	0
Phase 4	1	0	1	0
Phase 3	2	1	1	0
Phase 2	126	54	72	0
Phase 1	0	0	0	0
Uncertain	0	0	0	0
Total	129	55	74	0

Turning our eyes towards the chronological distribution of the documented specimens, those from Index Trenches 1C11 and 1D5 in the Central Area cover the whole stratigraphy of the site (Phases 1 to 5), although the number of documented specimens are not even due to the actual number of unearthed potsherds.

The East Area yielded extensively pottery from Phase 4. Those from the Northwest Area were found in association with brick structure complex which might belong to Phase 2. Those from the North Extension were chosen from the lower part of the stratigraphy in the Index Trench 2D9. That is, the documented specimens mostly belong to Phase 2. Those from the Index Trench 3 in the North Area belong to Phase 2 and 3.

As Tables 6.27 and 6.28 show, the number of documented specimens of Phase 1 is quite limited as the excavated area of Phase 1 is extremely small. Those from Phases 2 to 4 are in a larger number. In the Index Trench 1D5, there are a fair number of documented potsherds which belong to Phases 2 to 4. Although the number of documented potsherds from Phase 5 is quite small from these two trenches, it can be compensated for by those from the uppermost level, i.e. Phase 5, from the whole Central Area. In this way, the entire stratigraphy of the site can be covered by the documented specimens in the Central Area.

6.1 Stratigraphic occurrences of the Harappan pottery

(Tables 6.29 - 6.36)

As is shown in Table 6.29, the Harappan pottery occurs in all of the areas, but the number of documented potsherds is the largest in the Central Area, followed by the North Area, the North Extension and the Northwest Area in turn. This is due to the facts that the Central Area is the largest

Table 6.29 Number of potsherds based on the formal classifications of the Harappan pottery

All areas	Total	Pot	Jar	Pot or Jar	Bowl	BoS	Dish	DoS	Beaker	Lid	Plate
Central Area	239	146	6	4	26	0	12	37	3	3	2
East Area	27	18	0	0	3	0	1	4	0	1	0
West Area	0	0	0	0	0	0	0	0	0	0	0
Northwest Area	51	32	1	2	6	0	1	9	0	0	0
North Extension	56	36	1	0	4	0	0	10	1	3	1
North Area	78	51	1	7	11	0	1	5	1	0	1
Kiln Area	19	11	0	0	3	0	0	4	0	0	1
uncertain	6	0	1	0	2	0	1	2	0	0	0
Total	476	294	10	13	55	0	16	71	5	7	5

Central Area	Total	Pot	Jar	Pot or Jar	Bowl	BoS	Dish	DoS	Beaker	Lid	Plate
Phase 5	58	24	4	3	10	0	1	13	2	1	0
Phase 4	52	32	0	0	3	0	2	14	0	1	0
Phase 3	18	8	0	1	2	0	2	4	1	0	0
Phase 2	98	73	1	0	8	0	7	6	0	1	2
Phase 1	10	6	1	0	3	0	0	0	0	0	0
uncertain	3	3	0	0	0	0	0	0	0	0	0
Total	239	146	6	4	26	0	12	37	3	3	2

East Area	Total	Pot	Jar	Pot or Jar	Bowl	BoS	Dish	DoS	Beaker	Lid	Plate
Phase 5	0	0	0	0	0	0	0	0	0	0	0
Phase 4	27	18	0	0	3	1	1	4	0	1	0
Phase 3	0	0	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0
Total	27	18	0	0	3	1	1	4	0	1	0

Northwest Area	Total	Pot	Jar	Pot or Jar	Bowl	BoS	Dish	DoS	Beaker	Lid	Plate
Phase 5	0	0	0	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0	0	0
Phase 2	50	31	1	2	6	0	1	9	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0
uncertain	1	1	0	0	0	0	0	0	0	0	0
Total	51	32	1	2	6	0	1	9	0	0	0

North Extension	Total	Pot	Jar	Pot or Jar	Bowl	BoS	Dish	DoS	Beaker	Lid	Plate
Phase 5	0	0	0	0	0	0	0	0	0	0	0
Phase 4	1	0	0	0	0	0	0	0	1	0	0
Phase 3	1	1	0	0	0	0	0	0	0	0	0
Phase 2	54	35	1	0	4	0	0	10	0	3	1
Phase 1	0	0	0	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0
Total	56	36	1	0	4	0	0	10	1	3	1

North Area	Total	Pot	Jar	Pot or Jar	Bowl	BoS	Dish	DoS	Beaker	Lid	Plate
Phase 5	0	0	0	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0	0	0
Phase 3	74	48	1	7	10	0	1	1	5	0	1
Phase 2	5	4	0	0	1	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	5	1	0	1

Table 6.30 Number of the Harappan Pot Type 1 Rim Types

All	Total	Type 1	Type 2	Type 3	Type 4	Type 5
Total	129	43	51	33	1	1

Central Area	Total	Type 1	Type 2	Type 3	Type 4	Type 5
Phase 5	9	5	1	2	1	0
Phase 4	15	6	3	6	0	0
Phase 3	6	3	2	1	0	0
Phase 2	27	7	15	5	0	0
Phase 1	2	2	0	0	0	0
uncertain	1	0	0	1	0	0
Total	60	23	21	15	1	0

East Area	Total	Type 1	Type 2	Type 3	Type 4	Type 5
Phase 5	0	0	0	0	0	0
Phase 4	8	2	3	3	0	0
Phase 3	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0
uncertain	0	0	0	0	0	0
Total	8	2	3	3	0	0

Northwest Area	Total	Type 1	Type 2	Type 3	Type 4	Type 5
Phase 5	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0
Phase 2	20	9	6	5	0	0
Phase 1	0	0	0	0	0	0
uncertain	0	0	0	0	0	0
Total	20	9	6	5	0	0

North Extension	Total	Type 1	Type 2	Type 3	Type 4	Type 5
Phase 5	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0
Phase 2	17	4	8	5	0	0
Phase 1	0	0	0	0	0	0
uncertain	0	0	0	0	0	0
Total	17	4	8	5	0	0

North Area	Total	Type 1	Type 2	Type 3	Type 4	Type 5
Phase 5						
Phase 4						
Phase 3						
Phase 2						
Phase 1						
uncertain						
Total	0	0	0	0	0	0

Kiln Area	Total	Type 1	Type 2	Type 3	Type 4	Type 5
Total	5	0	3	2	0	0

Table 6.31 RD distribution of the Harappan Pot Rim Type 1

All	Total	1	2	3	4	5	6	7	8	9	10	11
Central Area	59	0	27	15	8	3	2	0	3	0	0	1
East Area	9	0	1	4	1	1	0	0	1	0	0	1
Northwest Area	22	0	5	11	2	0	1	0	1	0	2	0
North Extension	17	1	7	4	1	1	0	0	0	1	1	1
North Area	19	1	4	5	3	0	1	2	3	0	0	0
Kiln Area	5	0	0	3	1	0	1	0	0	0	0	0
Total	131	2	44	42	16	5	5	2	8	1	3	3

Central Area	Total	1	2	3	4	5	6	7	8	9	10	11
Phase 5	9	0	6	0	1	0	1	0	1	0	0	0
Phase 4	15	0	3	6	1	3	0	0	1	0	0	1
Phase 3	6	0	2	2	2	0	0	0	0	0	0	0
Phase 2	26	0	14	7	3	0	1	0	1	0	0	0
Phase 1	2	0	2	0	0	0	0	0	0	0	0	0
uncertain	1	0	0	0	1	0	0	0	0	0	0	0
Total	59	0	27	15	8	3	2	0	3	0	0	1

East Area	Total	1	2	3	4	5	6	7	8	9	10	11
Phase 5	0	0	0	0	0	0	0	0	0	0	0	0
Phase 4	9	0	1	4	1	1	0	0	1	0	0	1
Phase 3	0	0	0	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0	0
Total	9	0	1	4	1	1	0	0	1	0	0	1

Northwest Area	Total	1	2	3	4	5	6	7	8	9	10	11
Phase 5	0	0	0	0	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0	0	0	0
Phase 2	22	0	5	11	2	0	1	0	1	0	2	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0	0
Total	22	0	5	11	2	0	1	0	1	0	2	0

North Extension	Total	1	2	3	4	5	6	7	8	9	10	11
Phase 5	0	0	0	0	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0	0	0	0
Phase 2	17	1	7	4	1	1	0	0	0	1	1	1
Phase 1	0	0	0	0	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0	0
Total	17	1	7	4	1	1	0	0	0	1	1	1

North Area	Total	1	2	3	4	5	6	7	8	9	10	11
Phase 5	0	0	0	0	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0	0	0	0
Phase 3	17	1	3	5	2	0	1	2	3	0	0	0
Phase 2	2	0	1	0	1	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0	0
Total	19	1	4	5	3	0	1	2	3	0	0	0

Kiln Area	Total	1	2	3	4	5	6	7	8	9	10	11
Total	5	0	0	3	1	0	1	0	0	0	0	0

Table 6.32 NH/RD distribution of the Harappan Pot Rim Type 1

All	**Total**	**1**	**2**	**3**	**4**	**5**
Central Area	32	3	15	12	2	0
East Area	6	2	3	1	0	0
Northwest Area	8	1	5	2	0	0
North Extension	11	2	3	6	0	0
North Area	9	2	4	3	0	0
Kiln Area	3	0	2	1	0	0
Total	69	10	32	25	2	0

Central Area	**Total**	**1**	**2**	**3**	**4**	**5**
Phase 5	6	0	0	4	2	0
Phase 4	9	2	5	2	0	0
Phase 3	3	1	2	0	0	0
Phase 2	14	0	8	6	0	0
Phase 1	0	0	0	0	0	0
uncertain	0	0	0	0	0	0
Total	32	3	15	12	2	0

East Area	**Total**	**1**	**2**	**3**	**4**	**5**
Phase 5	0	0	0	0	0	0
Phase 4	6	2	3	1	0	0
Phase 3	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0
uncertain	0	0	0	0	0	0
Total	6	2	3	1	0	0

Northwest Area	**Total**	**1**	**2**	**3**	**4**	**5**
Phase 5	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0
Phase 2	8	1	5	2	0	0
Phase 1	0	0	0	0	0	0
uncertain	0	0	0	0	0	0
Total	8	1	5	2	0	0

North Extension	**Total**	**1**	**2**	**3**	**4**	**5**
Phase 5	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0
Phase 2	11	2	3	6	0	0
Phase 1	0	0	0	0	0	0
uncertain	0	0	0	0	0	0
Total	11	2	3	6	0	0

North Area	**Total**	**1**	**2**	**3**	**4**	**5**
Phase 5	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0
Phase 3	7	2	4	2	0	0
Phase 2	1	0	0	1	0	0
Phase 1	0	0	0	0	0	0
uncertain	0	0	0	0	0	0
Total	8	2	4	3	0	0

Kiln Area	**Total**	**1**	**2**	**3**	**4**	**5**
Total	3	0	2	1	0	0

Table 6.33 MRD/ND distribution of the Harappan Pot Rim Type 1

All	**Total**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Central Area	52	0	16	28	6	2	0	0
East Area	9	0	1	5	3	0	0	0
Northwest Area	19	0	8	7	2	0	1	1
North Extension	15	0	8	5	2	0	0	0
North Area	16	1	6	7	2	0	0	0
Kiln Area	5	0	2	2	0	1	0	0
Total	116	1	41	54	15	3	1	1

Central Area	**Total**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Phase 5	9	0	2	5	1	1	0	0
Phase 4	13	4	7	1	1	0	0	0
Phase 3	6	0	3	3	0	0	0	0
Phase 2	23	0	7	12	4	0	0	0
Phase 1	1	0	0	1	0	0	0	0
uncertain	0	0	0	0	0	0	0	0
Total	52	4	19	22	6	1		

East Area	**Total**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Phase 5	0	0	0	0	0	0	0	0
Phase 4	9	0	1	5	3	0	0	0
Phase 3	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0
Total	9	0	1	5	3	0	0	0

Northwest Area	**Total**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Phase 5	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0
Phase 2	19	0	8	7	2	0	1	1
Phase 1	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0
Total	19	0	8	7	2	0	1	1

North Extension	**Total**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Phase 5	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0
Phase 2	15	0	8	5	2	0	0	0
Phase 1	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0
Total	15	0	8	5	2	0	0	0

North Area	**Total**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Phase 5	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0
Phase 3	14	1	6	5	2	0	0	0
Phase 2	2	0	0	2	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0
Total	16	1	6	7	2	0	0	0

Kiln Area	**Total**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Total	5	0	2	2	0	1	0	0

Type B is absent in Phase 1 probably due to the scarcity of the total number of potsherds from Phase 1. Type C also occurs in all phases except for Phase 1, among which Phase 4 yields relatively larger numbers. One specimen of Type D was found in Phase 5.

In regards to the RD distributions of the entire specimens of Type 1 (Table 6.31), RD classes 2 and 3 occupy a dominant position followed by RD class 4. Those of RD class 5 scatter in various phases though they are less in number. It may be noted that Phase 2 yields the largest number of RD class 2 in the Central Area whereas RD class 3 is the largest in the Northwest area which may correspond to Phase 2. If the correlation between Phase 2 of the Central Area and the phase of the Northwest Area is accepted, the difference of numbers of RD classes 2 and 3 in these two areas may indicate a spatial variation of occurrences or a sampling error.

In terms of the NH/RD classes or the tallness of the neck of Pots (Table 6.32), Classes 2 and 3 are predominant. Two specimens of class 4 occur in Phase 5 of the Central Area.

The out-curveness of the neck shown by the MRD/ND classes is dominated by class 2 and 3 through all areas (Table 6.33). This tendency can be also observed in the entire stratigraphy of the Central Area. Those which show class 4 onwards are distributed sporadically in Phases 2 to 5.

The Harappan Pot Types 2 to 4 are prominently less in number than Type 1. Although it is difficult to detect any clear tendency of distribution among these types, it can be noted that these types make occurrence from Phases 2 to 5 (Table 6.34).

Jar

Only 10 specimens of Jars were found in the documented specimens, among which three are the S-shaped Jars and seven belong to the Perforated Jars. Those of S-shaped Jars are all found in Phase 5 in the Central Area (Figure 6.35). The perforated Jars occur in the Central Area, the Northwest Area, the North Extension and the North Area (Figure 6.35). Those from the Central Area were found in Phases 1, 2 and 5.

Bowl

The Harappan Bowl is dominated by Type 1 followed by Type 2. Types 3 and 4 are limited in number. In the Central Area, Type 1 appears in Phases 1 to 5 and Type 2 in Phases 2 to 5 (Figures 6.32, 6.33). Type 3 was found in Phases 3 and 4 (Table 6.35).

In the RD distribution of Type 1, they are distributed in Classes 6 to 10 as a whole and in Classes 6 to 9 in the Central Area. Class 7 is dominant followed by class 6. Although the documented specimens are relatively small in number, each RD class occurs sporadically in all phases showing no salient trend in their stratigraphic distribution (Table 6.36).

Type 2 is noticeable in RD classes 6 to 10 as a whole similarly to Type 1. It also occurs in a sporadic way through phases (Table 6.36).

Dish

Only 13 specimens are noticed in the documented specimens. Type 1 (12 specimens) outnumbers Types 2 and 3 (one in each). In Type 1, 11 specimens were found in the Central Area and one from the North Area. In the Central Area, they are distributed in Phase 2 (seven specimens), Phase 3 (one specimen), Phase 4 (two specimens), and Phase 5 (one specimen). Type 2 was found in the East Area (Phase 4) and Type 3 from the surface.

Dish-on-Stand

The Harappan Dish-on-Stand can be classified into three types mainly based on dish shapes. Table 6.37 indicates spatial and stratigraphic distributions of types with intact portions. Except for Type 3 which was found only in one specimen, all types occur in all areas and phases showing no variation (Figure 6.34).

In regards to the RD distribution, Type 1 is represented by classes 5 to 9, among which Classes 7 and 8 are dominant. In the Central Area, one

Table 6.34 Number of potsherds of the Harappan Pot Types 2 - 4

All areas	***Pot Type 2***	***Pot Type 3***	***Pot Type 4***	***Total***
Central Area	12	0	1	13
East Area	0	0	0	0
West Area	0	0	0	0
Northwest Area	2	0	0	2
North Extension	3	1	1	5
North Area	4	0	2	6
Kiln Area	0	0	0	0
uncertain	0	0	0	0
Total	21	1	4	26

Central Area	***Pot Type 2***	***Pot Type 3***	***Pot Type 4***	***Total***
Phase 5	1	0	1	2
Phase 4	4	0	0	4
Phase 3	0	0	0	0
Phase 2	7	0	0	7
Phase 1	0	0	0	0
uncertain	0	0	0	0
Total	12	0	1	13

North Extension	***Pot Type 2***	***Pot Type 3***	***Pot Type 4***	***Total***
Phase 5	0	0	0	0
Phase 4	0	0	0	0
Phase 3	1	0	0	1
Phase 2	2	1	1	4
Phase 1	0	0	0	0
uncertain	0	0	0	0
Total	3	1	1	5

North Area	***Pot Type 2***	***Pot Type 3***	***Pot Type 4***	***Total***
Phase 5	0	0	0	0
Phase 4	0	0	0	0
Phase 3	4	0	1	5
Phase 2	0	0	0	0
Phase 1	0	0	0	0
uncertain	0	0	0	0
Total	4	0	1	5

in excavated area and that the those from other areas were less subjected to the documentation. Therefore the following discussion is mainly based on those from the Central Area.

Pot

The Harappan Pot can be classified into four types based on the body shapes.

Type 1 having a globular or elliptical body is represented by 59 documented specimens in the Central Area. They can be classified into five sub-types, i.e. Type A to E based on the rim shapes. Among these, Type A is dominant, followed by Types B and C. Type D is limited in number counting only one specimen. No specimen of Type E is noticed in the Central Area. In the North Extension and the North Area, Type B outnumbers Type A.

In terms of the stratigraphic occurrences (Table 6.30, Figures 6.30, 6.31), Type A occurs in a largest number in Phase 2. This is due to the relatively larger numbers of the documented specimens in Phase 2, in which other types are also quite larger than other phases. However it can be pointed out that Type A is dominant through all phases in the Central Area.

Table 6.35 Number of the Harappan Bowl Rim Types

All	Total	Type 1	Type 2	Type 3	Type 4
Total	49	24	15	4	6

Central Area	Total	Type 1	Type 2	Type 3	Type 4
Phase 5	7	3	3	0	2
Phase 4	3	1	2	0	0
Phase 3	2	0	0	2	0
Phase 2	8	6	1	1	0
Phase 1	2	2	0	0	0
uncertain	0	0	0	0	0
Total	22	12	6	3	2

East Area	Total	Type 1	Type 2	Type 3	Type 4
Phase 5	0	0	0	0	0
Phase 4	3	2	1	0	0
Phase 3	0	0	0	0	0
Phase 2	0	0	0	0	0
Phase 1	0	0	0	0	0
uncertain	0	0	0	0	0
Total	3	2	1	0	0

Northwest Area	Total	Type 1	Type 2	Type 3	Type 4
Phase 5	0	0	0	0	0
Phase 4	0	0	0	0	0
Phase 3	0	0	0	0	0
Phase 2	5	1	1	1	2
Phase 1	0	0	0	0	0
uncertain	0	0	0	0	0
Total	5	1	1	1	2

North Extension	Total	Type 1	Type 2	Type 3	Type 4
Phase 5	0	0	0	0	0
Phase 4	0	0	0	0	0
Phase 3	0	0	0	0	0
Phase 2	3	3	0	0	0
Phase 1	0	0	0	0	0
uncertain	0	0	0	0	0
Total	3	3	0	0	0

North Area	Total	Type 1	Type 2	Type 3	Type 4
Phase 5					
Phase 4					
Phase 3					
Phase 2					
Phase 1					
uncertain					
Total	0	0	0	0	0

Kiln Area	Total	Type 1	Type 2	Type 3	Type 4
Total	3	1	2	0	0

Table 6.36 RD distribution of the Harappan Bowl

HR Bowl Type 1 RD	**Total**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Central Area	13	0	0	0	0	0	4	6	1	2	0	0
East Area	2	0	0	0	0	0	0	0	1	0	1	0
Northwest Area	2	0	0	0	0	0	1	0	0	1	0	0
North Extension	3	0	0	0	0	0	0	1	2	0	0	0
North Area	3	0	0	0	0	0	1	2	0	0	0	0
Kiln Area	1	0	0	0	0	0	0	1	0	0	0	0
uncertain	2	0	0	0	0	0	0	0	0	0	2	0
Total	26	0	0	0	0	0	6	10	4	3	3	0

Central Area	**Total**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Surface	0	0	0	0	0	0	0	0	0	0	0	0
Phase 5	3	0	0	0	0	0	1	2	0	0	0	0
Phase 4	1	0	0	0	0	0	0	0	1	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0	0	0	0
Phase 2	7	0	0	0	0	0	2	3	0	2	0	0
Phase 1	2	0	0	0	0	0	1	1	0		0	0
Total	13	0	0	0	0	0	4	6	1	2	0	0

HR Bowl Type 2 RD	**Total**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Central Area	6	0	0	0	0	0	2	0	4	0	0	0
East Area	1	0	0	0	0	0	0	0	1	0	0	0
Northwest Area	1	0	0	0	0	0	0	0	0	0	1	0
North Extension	0	0	0	0	0	0	0	0	0	0	0	0
North Area	5	0	0	0	0	0	1	1	0	2	1	0
Kiln Area	1	0	0	0	0	0	1	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0	0
Total	14	0	0	0	0	0	4	1	5	2	2	0

Central Area	**Total**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Surface	0	0	0	0	0	0	0	0	0	0	0	0
Phase 5	0	0	0	0	0	0	1	0	2	0	0	0
Phase 4	0	0	0	0	0	0	0	0	2	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	1	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	0	4	0	0	0

specimen of class 5 belongs to Phase 2 and those of other classes were found in Phase 3 onwards. The scarcity of numbers of examples makes it difficult to point out any temporal variation.

Type 2 is distributed similarly in RD classes 6 to 9. There is no clear pattern in their stratigraphic distribution.

Type 3 found in Phase 4 of the Central Area belongs to RD class 6.

Beaker

Only five specimens of the Harappan Beakers were found in the documented specimens. Among them, three specimens are from the Central Area, and one each from the North Extension and the North Area. In the Central Area, Phase 3 yields one specimen and Phase 5 two specimens. One from the North Extension belongs to Phase 4 and another from the North Area to Phase 3.

Lid

Six specimens were identified as Lids, among which three specimens were found in the Central Area and three specimens from the North Extension. In the Central Area, two of Type 1 were found, one

Table 6.37 Distribution of the Harappan Dish-on-Stand Types

HR DoS	***Total***	***Type 1 Rim***	***Type 1 Body***	***Type 1 Stem***	***Type 1 Pedestal***	***Type 2 Rim***	***Type 2 Body***	***Type 2 Pedestal***
Central Area	36	10	0	6	10	4	1	4
East Area	4	0	0	1	2	0	1	0
Northwest Area	9	1	0	0	3	4	0	1
North Extension	10	2	0	1	3	1	2	1
North Area	5	1	0	0	4	0	0	0
Kiln Area	4	1	3	0	0	0	0	0
uncertain	1	0	0	0	0	0	0	1
Total	69	15	3	8	22	9	4	7

Central Area	***Total***	***Type 1 Rim***	***Type 1 Body***	***Type 1 Stem***	***Type 1 Pedestal***	***Type 2 Rim***	***Type 2 Body***	***Type 2 Pedestal***
Surface	0	0	0	0	0	0	0	0
Phase 5	12	2	0	2	1	3	1	3
Phase 4	14	6	0	2	4	1	0	0
Phase 3	4	1	0	0	3	0	0	0
Phase 2	6	1	0	2	1	0	1	1
Phase 1	0	0	0	0	0	0	0	0
Total	36	10	0	6	9	4	2	4

East Area	***Total***	***Type 1 Rim***	***Type 1 Body***	***Type 1 Stem***	***Type 1 Pedestal***	***Type 2 Rim***	***Type 2 Body***	***Type 2 Pedestal***
Surface	0	0	0	0	0	0	0	0
Phase 5	0	0	0	0	0	0	0	0
Phase 4	4	0	0	1	2	0	1	0
Phase 3	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0
Total	4	0	0	1	2	0	1	0

Northwest Area	***Total***	***Type 1 Rim***	***Type 1 Body***	***Type 1 Stem***	***Type 1 Pedestal***	***Type 2 Rim***	***Type 2 Body***	***Type 2 Pedestal***
Surface	0	0	0	0	0	0	0	0
Phase 5	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0
Phase 2	9	1	0	0	3	4	0	1
Phase 1	0	0	0	0	0	0	0	0
Total	9	1	0	0	3	4	0	1

North Extension	***Total***	***Type 1 Rim***	***Type 1 Body***	***Type 1 Stem***	***Type 1 Pedestal***	***Type 2 Rim***	***Type 2 Body***	***Type 2 Pedestal***
Surface	0	0	0	0	0	0	0	0
Phase 5	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0
Phase 2	10	2	0	1	3	1	2	1
Phase 1	0	0	0	0	0	0	0	0
Total	10	2	0	1	3	1	2	1

North Area	***Total***	***Type 1 Rim***	***Type 1 Body***	***Type 1 Stem***	***Type 1 Pedestal***	***Type 2 Rim***	***Type 2 Body***	***Type 2 Pedestal***
Surface	0	0	0	0	0	0	0	0
Phase 5	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0
Phase 3	5	1	0	0	4	0	0	0
Phase 2	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0
Total	5	1	0	0	4	0	0	0

Phase	
5	
4	
3	
2	
1	

Figure 6.30 Phase-wise occurrences of the Harappan Pots

Phase	
5	
4	East Area
3	North Area
2	Northwest Area
2	North Extension

Figure 6.31 Phase-wise occurrences of the Harappan Pots

Phase		
5	Type 1	Type 2
4		
3		Type 3
2		Type 2 Type 3
1		

Figure 6.32 Phase-wise occurrences of the Harappan Bowls

Phase	
5	
4	Type 1 Type 2 East Area
3	Type 2 North Area
2	Type 3 Type 2 Northwest Area
2	North Extension

Figure 6.33 Phase-wise occurrences of the Harappan Bowls

Phase		
5	Type 1	Type 2
4		
3		
2	North Extension	Northwest Area
1		

Figure 6.34 Phase-wise occurrences of the Harappan Dish-on-Stands

Phase	
5	S-shaped Jar; Perforated Jar; Beaker
4	North Extension
3	North Area; North Area
2	Northwest Area; North Extension
1	

Figure 6.35 Phase-wise occurrences of the other Harappan forms

each from Phases 3 and 4. Type 2 counts only one specimen which was found in Phase 5. Those from the North Extension belong to Phase 2.

Plate

Five specimens of Plates were found in the documented specimens. Two specimens come from the Central Area, one each from the North Extension, the North Are and the Kiln. Those from the Central Area and the North Extension belong to Phase 2 and one from the North Area to Phase 3.

6.3 Stratigraphic occurrences of the Non-Harappan Red ware

The total number of documented specimens of the Non-Harappan pottery is 716, among which Pots are in a dominant position. It is followed by Bowls. Other forms are conspicuously limited in number. This composition is common to all areas, indicating that the dominance of Pots is a striking feature of the Non-Harappan ceramic assemblage.

Table 6.38 exhibits the number of the Red ware and the Grey ware through areas and phases. The Grey ware is much less than the Red ware, but it occurs through different areas and phases, indicating that the Grey ware formed a part of the ceramic assemblage at Farmana during the Harappan period.

In Table 6.39, the distributions of various forms of the Non-Harappan pottery are indicated. It shows that the Pots and Bowls form dominant part in the assemblage through areas and phases.

Pot

The Non-Harappan Pots can be classified into five types based on the rim shapes. Among these types, Types A and C are dominant both as a whole and in each area (Table 6.40, Figures 6.36, 6.37). In the Central Area, Type A is outstanding in Phase 4, but it is not clear whether this reflects spatial or temporal variations or not as Type 1 keeps a dominant position in other phases as well. In Northwest Area and the North Area, Type C is relatively larger in number than other types, whereas in the North Extention Type A is eminent in presence.

In the RD distribution, as a whole, they are distributed in Class 1 to 8, among which Classes 3 and 4 show dominance, followed by Classes 2 and 5. This tendency can be observed commonly in each area (Table 6.41). The stratigraphic distribution in the Central Area also points to a similar composition.

In regards to the tallness of the neck indicated by the NH/RD classes, Class 2 occupy a dominant position both as a whole and in each area (Table 6.42). It is followed by classes 3, 1 and 4 in turn. In the Central Area, classes 2 and 3 become dominant in Phase 2 onwards, although the sample number in Phase 1 is very limited. It is not clear whether the increase of class 2 in Phase 5 exhibits any temporal variation or not.

In the MRD/ND classes which show the outcurveness of the neck, classes 2 to 4 are clearly dominant. It is common to each area (Table 6.43). In the Central Area, Classes 3 and 4 are in a dominant position whereas class 2 becomes predominant in Phase 5. Phase 4 exhibits similar numbers of classes 2 to 4. In the North Extension (Phase 2), class 2 occupies a larger percentage which is almost equal to that of class 3. This may indicates a spatial variation which depends on different contexts.

Bowl

In the Non-Harappan Bowls, Type 1 is remarkably outstanding. It is followed by Type 3. Types 2 and 5 are small in number. This feature is commonly observed in each area (Table 6.44, Figures 6.38 - 6.40).

In regards to the RD distribution of Type 1, the specimens are distributed in classes 3 to 10 with a fair number in each class. It is also common to each area and to the stratigraphic distribution in the Central Area, showing no spatial and temporal variation (Table 6.45).

Table 6.37 Number of RW and GW of the Non-Harappan pottery

Non-Harappan	***Total***	***RW***	***GW***
Exploration	26	20	6
Excavation	690	641	49
Total	716	661	55

Central Area	***Total***	***RW***	***GW***
Phase 5	147	137	10
Phase 4	55	49	6
Phase 3	30	26	4
Phase 2	96	87	9
Phase 1	13	11	2
Uncertain	4	4	0
Total	345	314	31

East Area	***Total***	***RW***	***GW***
Phase 5	0	0	0
Phase 4	38	36	2
Phase 3	0	0	0
Phase 2	0	0	0
Phase 1	0	0	0
Uncertain	0	0	0
Total	38	36	2

Northwest Area	***Total***	***RW***	***GW***
Phase 5	0	0	0
Phase 4	0	0	0
Phase 3	0	0	0
Phase 2	85	82	3
Phase 1	0	0	0
Uncertain	6	6	0
Total	91	88	3

North Extension	***Total***	***RW***	***GW***
Phase 5	0	0	0
Phase 4	1	1	0
Phase 3	1	1	0
Phase 2	72	72	0
Phase 1	0	0	0
Uncertain	0	0	0
Total	74	74	0

North Area	***Total***	***RW***	***GW***
Phase 5	0	0	0
Phase 4	0	0	0
Phase 3	115	104	11
Phase 2	9	9	0
Phase 1	0	0	0
Uncertain	0	0	0
Total	124	113	11

Kiln Area	***Total***	***RW***	***GW***
Total	13	11	2

Index Trenches

1C11	***Total***	***RW***	***GW***
Total	130	111	19
Phase 5	7	6	1
Phase 4	23	20	3
Phase 3	22	18	4
Phase 2	61	52	9
Phase 1	13	11	2
Uncertain	4	4	0
Total	130	111	19

1D5	***Total***	***RW***	***GW***
Total	78	75	3
Phase 5	3	3	0
Phase 4	32	29	3
Phase 3	8	8	0
Phase 2	35	35	0
Phase 1	0	0	0
Uncertain	0	0	0
Total	78	75	3

2D9	***Total***	***RW***	***GW***
Total	0	0	0
Phase 5	0	0	0
Phase 4	1	1	0
Phase 3	1	1	0
Phase 2	72	72	0
Phase 1	0	0	0
Uncertain	0	0	0
Total	74	74	0

Table 6.38 Number of potsherds based on the formal classifications of the Non-Harappan pottery
The counts in this table include both the Red ware and the Grey ware.

	Total	Pot	Bowl	Dish	DoS	P. Bowl	P. Pot or Bowl	Lid
Central Area	345	240	87	0	9	2	7	0
East Area	38	24	13	0	1	0	0	0
West Area	1	1	0	0	0	0	0	0
Northwest Area	91	70	17	0	3	0	1	0
North Extension	74	56	16	0	1	0	0	1
North Area	125	77	43	0	4	0	1	0
Kiln Area	13	6	6	0	0	0	1	0
uncertain	29	14	11	2	2	0	0	0
Total	716	488	193	2	20	2	10	1

Central Area	**Total**	**Pot**	**Bowl**	**Dish**	**DoS**	**P. Bowl**	**P. Pot or Bowl**	**Lid**
Phase 5	147	107	35	0	2	1	2	0
Phase 4	55	38	15	0	1	0	1	0
Phase 3	30	20	7	0	2	1	0	0
Phase 2	96	59	29	0	4	0	4	0
Phase 1	13	12	1	0	0	0	0	0
uncertain	4	4	0	0	0	0	0	0
Total	345	240	87	0	9	2	7	0

East Area	**Total**	**Pot**	**Bowl**	**Dish**	**DoS**	**P. Bowl**	**P. Pot or Bowl**	**Lid**
Phase 5	0	0	0	0	0	0	0	
Phase 4	38	24	13	0	1	0	0	0
Phase 3	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0
Total	38	24	13	0	1	0	0	0

Northwest Area	**Total**	**Pot**	**Bowl**	**Dish**	**DoS**	**P. Bowl**	**P. Pot or Bowl**	**Lid**
Phase 5	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0
Phase 2	85	65	16	0	3	0	1	0
Phase 1	0	0	0	0	0	0	0	0
uncertain	6	5	1	0	0	0	0	0
Total	91	70	17	0	3	0	1	0

North Extension	**Total**	**Pot**	**Bowl**	**Dish**	**DoS**	**P. Bowl**	**P. Pot or Bowl**	**Lid**
Phase 5	0	0	0	0	0	0	0	0
Phase 4	1	0	0	0	1	0	0	0
Phase 3	1	0	1	0	0	0	0	0
Phase 2	72	56	15	0	0	0	0	1
Phase 1	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0
Total	74	56	16	0	1	0	0	1

North Area	**Total**	**Pot**	**Bowl**	**Dish**	**DoS**	**P. Bowl**	**P. Pot or Bowl**	**Lid**
Phase 5	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0
Phase 2	115	69	41	0	4	0	1	0
Phase 1	9	7	2	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0
Total	124	76	43	0	4	0	1	0

Table 6.39 Number of the Non-Harappan Pot Rim Types

All	Total	Type A	Type B	Type C	Type D
Central Area	125	67	8	50	0
East Area	20	8	3	8	1
Northwest Area	49	20	3	26	0
North Extension	50	37	6	7	0
North Area	49	18	5	26	0
Kiln Area	4	3	0	1	0
Uncertain	6	1	0	4	1
Total	303	154	25	122	2

Central Area	Total	Type A	Type B	Type C	Type D
Phase 5	36	16	4	16	0
Phase 4	31	23	1	7	0
Phase 3	15	6	0	9	0
Phase 2	40	20	3	17	0
Phase 1	3	2	0	1	0
uncertain					
Total	125	67	8	50	0

East Area	Total	Type A	Type B	Type C	Type D
Phase 5	0	0	0	0	0
Phase 4	20	8	3	8	1
Phase 3	0	0	0	0	0
Phase 2	0	0	0	0	0
Phase 1	0	0	0	0	0
uncertain	0	0	0	0	0
Total	20	8	3	8	1

Northwest Area	Total	Type A	Type B	Type C	Type D
Phase 5	0	0	0	0	0
Phase 4	0	0	0	0	0
Phase 3	0	0	0	0	0
Phase 2	48	19	3	26	0
Phase 1	0	0	0	0	0
uncertain	1	1	0	0	0
Total	49	20	3	26	0

North Extension	Total	Type A	Type B	Type C	Type D
Phase 5	0	0	0	0	0
Phase 4	0	0	0	0	0
Phase 3	0	0	0	0	0
Phase 2	50	37	6	7	0
Phase 1	0	0	0	0	0
uncertain	0	0	0	0	0
Total	50	37	6	7	0

North Area	Total	Type A	Type B	Type C	Type D
Phase 5	0	0	0	0	0
Phase 4	0	0	0	0	0
Phase 3	45	16	5	24	0
Phase 2	4	2	0	2	0
Phase 1	0	0	0	0	0
uncertain	0	0	0	0	0
Total	49	18	5	26	0

Table 6.40 RD distribution of the Non-Harappan Pot Rim Type 1

All	***Total***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***
Central Area	162	1	19	83	44	9	3	2	1	0	0	0
East Area	20	0	5	7	6	1	1	0	0	0	0	0
Northwest Area	52	0	7	29	12	3	1	0	0	0	0	0
North Extension	50	0	9	22	11	6	1	1	0	0	0	0
North Area	68	1	5	37	20	5	0	0	0	0	0	0
Kiln Area	4	0	0	2	1	0	1	0	0	0	0	0
Uncertain	13	0	0	3	6	2	2	0	0	0	0	0
Total	356	2	45	180	94	24	7	3	1	0	0	0

Central Area	***Total***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***
Phase 5	69	1	6	36	20	5	1	0	0	0	0	0
Phase 4	31	0	4	12	10	2	1	1	1	0	0	0
Phase 3	16	0	3	10	2	0	1	0	0	0	0	0
Phase 2	40	0	6	22	10	1	0	1	0	0	0	0
Phase 1	5	0	0	2	2	1	0	0	0	0	0	0
uncertain	1	0	0	1	0	0	0	0	0	0	0	0
Total	162	1	19	83	44	9	3	2	1	0	0	0

East Area	***Total***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***
Phase 5	0	0	0	0	0	0	0	0	0	0	0	0
Phase 4	20	0	5	7	6	1	1	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0	0
Total	20	0	5	7	6	1	1	0	0	0	0	0

Northwest Area	***Total***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***
Phase 5	0	0	0	0	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0	0	0	0
Phase 2	48	0	5	28	11	3	1	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0	0
uncertain	4	0	2	1	1	0	0	0	0	0	0	0
Total	52	0	7	29	12	3	1	0	0	0	0	0

North Extension	***Total***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***
Phase 5	0	0	0	0	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0	0	0	0
Phase 2	50	0	9	22	11	6	1	1	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0	0
Total	50	0	9	22	11	6	1	1	0	0	0	0

North Area	***Total***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***
Phase 5	0	0	0	0	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0	0	0	0
Phase 3	62	1	4	35	18	4	0	0	0	0	0	0
Phase 2	6	0	1	2	2	1	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0	0
Total	68	1	5	37	20	5	0	0	0	0	0	0

Table 6.41 NH/RD distribution of the Non-Harappan Pot Rim Type 1

All	*Total*	*Class 1*	*Class 2*	*Class 3*	*Class 4*	*Class 5*
Central Area	111	11	59	25	14	2
East Area	15	2	7	5	1	0
Northwest Area	36	2	21	7	5	1
North Extension	40	14	16	6	3	1
North Area	32	1	21	6	4	0
Kiln Area	4	1	2	1	0	0
Uncertain	12	1	9	1	1	0
Total	250	32	135	51	28	4

Central Area	*Total*	*Class 1*	*Class 2*	*Class 3*	*Class 4*	*Class 5*
Phase 5	56	3	34	10	8	1
Phase 4	18	5	7	3	2	1
Phase 3	9	1	6	0	2	0
Phase 2	26	2	10	12	2	0
Phase 1	1	0	1	0	0	0
uncertain	1	0	1	0	0	0
Total	111	11	59	25	14	2

East Area	*Total*	*Class 1*	*Class 2*	*Class 3*	*Class 4*	*Class 5*
Phase 5	0	0	0	0	0	0
Phase 4	15	2	7	5	1	
Phase 3	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0
uncertain	0	0	0	0	0	0
Total	15	2	7	5	1	0

Northwest Area	*Total*	*Class 1*	*Class 2*	*Class 3*	*Class 4*	*Class 5*
Phase 5	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0
Phase 2	32	2	19	6	4	1
Phase 1	0	0	0	0	0	0
uncertain	4	0	2	1	1	0
Total	36	2	21	7	5	1

North Extension	*Total*	*Class 1*	*Class 2*	*Class 3*	*Class 4*	*Class 5*
Phase 5	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0
Phase 2	40	14	16	6	3	1
Phase 1	0	0	0	0	0	0
uncertain	0	0	0	0	0	0
Total	40	14	16	6	3	1

North Area	*Total*	*Class 1*	*Class 2*	*Class 3*	*Class 4*	*Class 5*
Phase 5	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0
Phase 3	29	1	20	4	4	0
Phase 2	3	0	1	2	0	0
Phase 1	0	0	0	0	0	0
uncertain	0	0	0	0	0	0
Total	32	1	21	6	4	0

Table 6.42 MRD/ND distribution of the Non-Harappan Pot Rim Type 1

All	***Total***	***Class 1***	***Class 2***	***Class 3***	***Class 4***	***Class 5***	***Class 6***	***Class 7***
Central Area	117	2	32	39	38	5	1	0
East Area	19	0	3	7	6	2	1	0
Northwest Area	41	0	15	11	10	3	2	0
North Extension	50	0	16	20	11	2	1	0
North Area	36	0	13	4	12	2	2	3
Kiln Area	4	0	2	1	0	1	0	0
Uncertain	6	0	4	0	1	0	0	1
Total	273	2	85	82	78	15	7	4

Central Area	***Total***	***Class 1***	***Class 2***	***Class 3***	***Class 4***	***Class 5***	***Class 6***	***Class 7***
Phase 5	33	0	16	6	7	3	1	0
Phase 4	30	0	9	10	11	0	0	0
Phase 3	14	1	3	3	7	0	0	0
Phase 2	37	1	4	18	13	1	0	0
Phase 1	3	0	0	2	0	1	0	0
uncertain	0	0	0	0	0	0	0	0
Total	117	2	32	39	38	5	1	0

East Area	***Total***	***Class 1***	***Class 2***	***Class 3***	***Class 4***	***Class 5***	***Class 6***	***Class 7***
Phase 5	0	0	0	0	0	0	0	0
Phase 4	19	0	3	7	6	2	1	0
Phase 3	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0
Total	19	0	3	7	6	2	1	0

Northwest Area	***Total***	***Class 1***	***Class 2***	***Class 3***	***Class 4***	***Class 5***	***Class 6***	***Class 7***
Phase 5	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0
Phase 2	40	0	14	11	10	3	2	0
Phase 1	0	0	0	0	0	0	0	0
uncertain	1	0	1	0	0	0	0	0
Total	41	0	15	11	10	3	2	0

North Extension	***Total***	***Class 1***	***Class 2***	***Class 3***	***Class 4***	***Class 5***	***Class 6***	***Class 7***
Phase 5	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0
Phase 2	50	0	16	20	11	2	1	0
Phase 1	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0
Total	50	0	16	20	11	2	1	0

North Area	***Total***	***Class 1***	***Class 2***	***Class 3***	***Class 4***	***Class 5***	***Class 6***	***Class 7***
Phase 5	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0
Phase 3	32	0	11	4	11	1	2	3
Phase 2	4	0	2	0	1	1	0	0
Phase 1	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0
Total	36	0	13	4	12	2	2	3

Table 6.43 Number of the Non-Harappan Bowl Types

	Total	***Type 1***	***Type 2***	***Type 3***	***Type 4***	***Type 5***
Central Area	69	60	0	7	2	0
East Area	11	8	0	3	0	0
Northwest Area	16	14	0	2	0	0
North Extension	16	13	0	0	3	0
North Area	39	31	2	5	0	1
Kiln Area	4	4	0	0	0	0
Uncertain	9	8	0	0	0	1
Total	164	138	2	17	5	2

Central Area	***Total***	***Type 1***	***Type 2***	***Type 3***	***Type 4***	***Type 5***
Phase 5	29	25	0	4	0	0
Phase 4	9	5	0	3	1	0
Phase 3	6	6	0	0	0	0
Phase 2	24	23	0	0	1	0
Phase 1	1	1	0	0	0	0
uncertain	0	0	0	0	0	0
Total	69	60	0	7	2	0

East Area	***Total***	***Type 1***	***Type 2***	***Type 3***	***Type 4***	***Type 5***
Phase 5	0	0	0	0	0	0
Phase 4	11	8	0	3	0	0
Phase 3	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0
uncertain	0	0	0	0	0	0
Total	11	8	0	3	0	0

Northwest Area	***Total***	***Type 1***	***Type 2***	***Type 3***	***Type 4***	***Type 5***
Phase 5	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0
Phase 2	15	13	0	2	0	0
Phase 1	0	0	0	0	0	0
uncertain	1	1	0	0	0	0
Total	16	14	0	2	0	0

North Extension	***Total***	***Type 1***	***Type 2***	***Type 3***	***Type 4***	***Type 5***
Phase 5	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0
Phase 3	1	1				
Phase 2	15	12	0	0	3	0
Phase 1	0	0	0	0	0	0
uncertain	0	0	0	0	0	0
Total	16	13	0	0	3	0

North Area	***Total***	***Type 1***	***Type 2***	***Type 3***	***Type 4***	***Type 5***
Phase 5	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0
Phase 3	37	30	2	4	0	1
Phase 2	2	1	0	1	0	0
Phase 1	0	0	0	0	0	0
uncertain	0	0	0	0	0	0
Total	39	31	2	5	0	1

Table 6.44 RD distribution of the Non-Harappan Bowl Type 1

All	***Total***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***
Central Area	60	0	0	7	9	7	10	11	7	5	4	0
East Area	8	0	0	1	2	2	1	0	1	0	1	0
Northwest Area	14	0	1	2	2	3	0	1	1	2	2	0
North Extension	13	0	1	1	0	1	2	3	2	2	1	0
North Area	31	0	0	5	8	3	1	6	4	2	2	0
Kiln Area	4	0	0	0	0	0	1	0	2	1	0	0
Uncertain	8	0	0	0	3	1	1	1	2	0	0	0
Total	138	0	2	16	24	17	16	22	19	12	10	0

Central Area	***Total***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***
Phase 5	24	0	0	0	0	4	6	8	1	3	3	0
Phase 4	5	0	0	2	1	0	1	1	0	0	0	0
Phase 3	6	0	0	0	2	1	1	0	1	1	0	0
Phase 2	23	0	0	5	6	2	2	2	4	1	1	0
Phase 1	1	0	0	0	0	0	0	0	1	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0	0
Total	59	0	0	7	9	7	10	11	7	5	4	0

East Area	***Total***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***
Phase 5	0	0	0	0	0	0	0	0	0	0	0	0
Phase 4	8	0	0	1	2	2	1	0	1	0	1	0
Phase 3	0	0	0	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0	0
Total	8	0	0	1	2	2	1	0	1	0	1	0

Northwest Area	***Total***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***
Phase 5	0	0	0	0	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0	0	0	0
Phase 2	13	0	1	2	2	3	0	1	1	2	1	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0	0
uncertain	1	0	0	0	0	0	0	0	0	0	1	0
Total	14	0	1	2	2	3	0	1	1	2	2	0

North Extension	***Total***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***
Phase 5	0	0	0	0	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0	0	0	0
Phase 3	1	0	0	0	0	0	0	1	0	0	0	0
Phase 2	12	0	1	1	0	1	2	2	2	2	1	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0	0
Total	13	0	1	1	0	1	2	3	2	2	1	0

North Area	***Total***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***
Phase 5	0	0	0	0	0	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0	0	0	0
Phase 3	30	0	0	5	8	3	1	6	4	2	1	0
Phase 2	1	0	0	0	0	0	0	0	0	0	1	0
Phase 1	0	0	0	0	0	0	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0	0
Total	31	0	0	5	8	3	1	6	4	2	2	0

Phase	
5	
4	
3	
2	
1	

Figure 6.36 Phase-wise occurrences of the Non-Harappan Pots

Phase	
5	
4	East Area
3	North Area
2	Northwest Area
2	North Extension

Figure 6.37 Phase-wise occurrences of the Non-Harappan Pots

Phase	
5	
4	
3	
2	
1	

Figure 6.38 Phase-wise occurrences of the Non-Harappan Bowls

Phase	
5	
4	East Area
3	North Area
2	Northwest Area
2	North Extension

Figure 6.39 Phase-wise occurrences of the Non-Harappan Bowls

Phase	
5	Type 3 Central Area
4	Central Area; East Area; Type 4 Central Area
3	Type 2 North Area; North Area
2	Northwest Area; North Area; North Extension
1	

Figure 6.40 Phase-wise occurrences of the Non-Harappan Bowls

Phase		
5	Central Area	
4	Central Area	East Area
3	Central Area	North Area
2	Central Area	
1	Central Area	

Figure 6.41 Phase-wise occurrences of the Non-Harappan Grey ware

Pedestalled Bowl

Only two specimens of Pedestalled Bowls were found in the documented specimens. Both specimens come from the Central Area, one specimen each in Phases 3 and 5.

Pedestalled Bowl or Pot

Nine specimens of pedestalled portion which may have belonged to Pedestalled Pots or Bowls. Six specimens were found in the Central Area, one specimen from the Northwest Area, one specimen from the North Area and one specimen from the Kiln. In the Central Area, four specimens belong to Phase 2 and one each from Phases 4 and 5.

Lid

Only one specimen of Lid is identified in the documented specimen, from Phase 2 in the North Extension.

6.3 Stratigraphic occurrences of the Non-Harappan Grey ware

55 specimens of Grey ware were identified in the documented specimens. As a whole, the Bowl is dominant, followed by the Dish-on-Stand and Pots. Pedestalled Pot and Dish are represented by few specimens. As the number of specimens are remarkably small, it is difficult to observe any clear spatial and temporal distribution (FIgure 6.41). It may be noted that the dominance of Bowls and Dish-on-Stands occurs commonly in each area.

Pot

Grey ware Pots are represented by 10 specimens, among which six specimens were found in the Central Area, three specimens from the North Area and one specimen from the surface. In the Central Area, they occur in Phases 1 to 5.

Pedestalled Pot

Only one specimen of Pedestalled Pot was found in the documented specimens. It belongs to Phase 5 in Central Area.

Bowl

The Bowl is represented by 23 specimens, among which 15 specimens were found in the Central Area. They occur in Phases 2 to 5, especially in Phases 4 and 5 in larger numbers.

Dish

Two specimens of Dish of Grey ware were found on the surface.

Dish-on-Stand

19 specimens of Dish-on-Stands were found in the documented specimens. Among them, nine specimens belong to the Central Area, one specimen to the East Area, three specimens to the Northwest Area, four specimens to the North Area and two specimens to the surface. In the Central Area, they make occurrences in Phases 2 to 5. It is difficult to make it clear whether the larger number in Phase 2 indicates any temporal variation.

8 CONCLUSION FOR THE POTTERY FROM THE SETTLEMENT AREA

1) Although the number of documented specimens is not even among phases due to the difference of the excavated area of each phase, the fact that the Harappan pottery and Non-Harappan pottery were found throughout all phases clearly indicates that pottery of both ceramic styles were imported into the site and consumed at the site side by side throughout the entire occupation period of the site.

2) As a whole, in the Harappan pottery assemblage, Pots occupy a dominant position, followed by Dish-on-Stands and Bowls. Other forms are very limited

in number. No clear change can be observed in the formal assemblage and shapes throughout the occupation period, although some specimens of Pots exhibit some later elements like an elongated body, which may indicate occupations in the later period in the Harappan period that had been destroyed or removed by the later activities.

3) The Non-Harappan pottery is classified into Red ware and Grey ware. The former is remarkably dominant in the assemblage. The latter may be regarded as a special ware of some kind.

4) Non-Harappan pottery shares a number of elements with the Sothi-Siswal pottery (Suraj Bhan 1975; Dikshit 1984; Lal *et al*. 2003), indicating that the Non-Harappan pottery from Farmana was a part of the local ceramic tradition which developed from the pre-Harappan ceramic tradition in the Ghaggar Plains. In terms of manufacturing technique, formal features and decoration elements, it clearly differs from the Harappan pottery. As the case of the Harappan pottery, Pots are dominant in the assemblage, followed by Bowls. Other forms are very sporadic in the assemblage. That is, the Pots and Bowls are the distinctive features of the Non-Harappan pottery at Farmana.

5) The Non-Harappan Grey ware consists of elements from both Harappan pottery and Non-Harappan pottery. The manufacturing technique is akin to that of the Non-Harappan pottery, whereas its formal assemblage including Dish-on-Stands which is basically absent in the Non-Harappan Red ware indicates relations with the Harappan pottery. The details of formal features of the Grey ware like the rim and body shapes are partially similar and partially different to/from the Non-Harappan pottery. These facts, in addition to the scarcity in number, may indicate that the Non-Harappan Grey ware was of a special nature in the ceramic assemblage during the Harappan period at Farmana.

6) Thus, the ceramic assemblage consisting of the Harappan pottery and the Non-Harappan pottery with formal features and manufacturing technique of their own is consistent throughout the entire occupational period at the site, showing no clear change of the ceramic assemblage. The 13 AMS ^{14}C dates which point to the Harappan period, although all the samples for the dating were not derived from any hearth or oven, ranges from 2536 BC (49.6%) 2492 BC (1 σ) to 2346 BC (46.1%) 2278 BC (1σ), indicating that the occupation in the excavated area at Farmana can be included in the early part of the entire Harappan period (2600 - 1900 BC). Correlating this occupation period and dates at Farmana with the chronology at the site of Harappa, the Farmana settlement roughly corresponds to Periods 3A and 3B at Farmana. This estimate may be corroborated by Gonzaque Quivron's relative chronology of the Harappan painted pottery (Quivron 2000), which indicates the specimens of the Harappan painted pottery from Farmana can be compared with those from Quivron's Early Period.

7) The Historical pottery consists of Pots, Bowls and a Lid. They are distinguished by their shapes, manufacturing techniques and decorative techniques. Stylistically it is akin to those pottery from Rang Mahal (Rydh 1959), Sonkh Period VI (Härtel 1993), Saheth Period III (Aboshi and Sonoda eds. 1997), etc. which are dated to the Gupta period. The AMS 14 C dates also point to the this period.

Along with minor objects of this period, the occurrence of pottery of this period is significant in order to understand the regional history of this period. It means that the whole North India was represented by a single ceramic style in the Gupta period indicating a extensive cultural interaction network over a wide area.

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Key for illustrations of pottery

- white slip
- red slip
- grey slip
- black slip

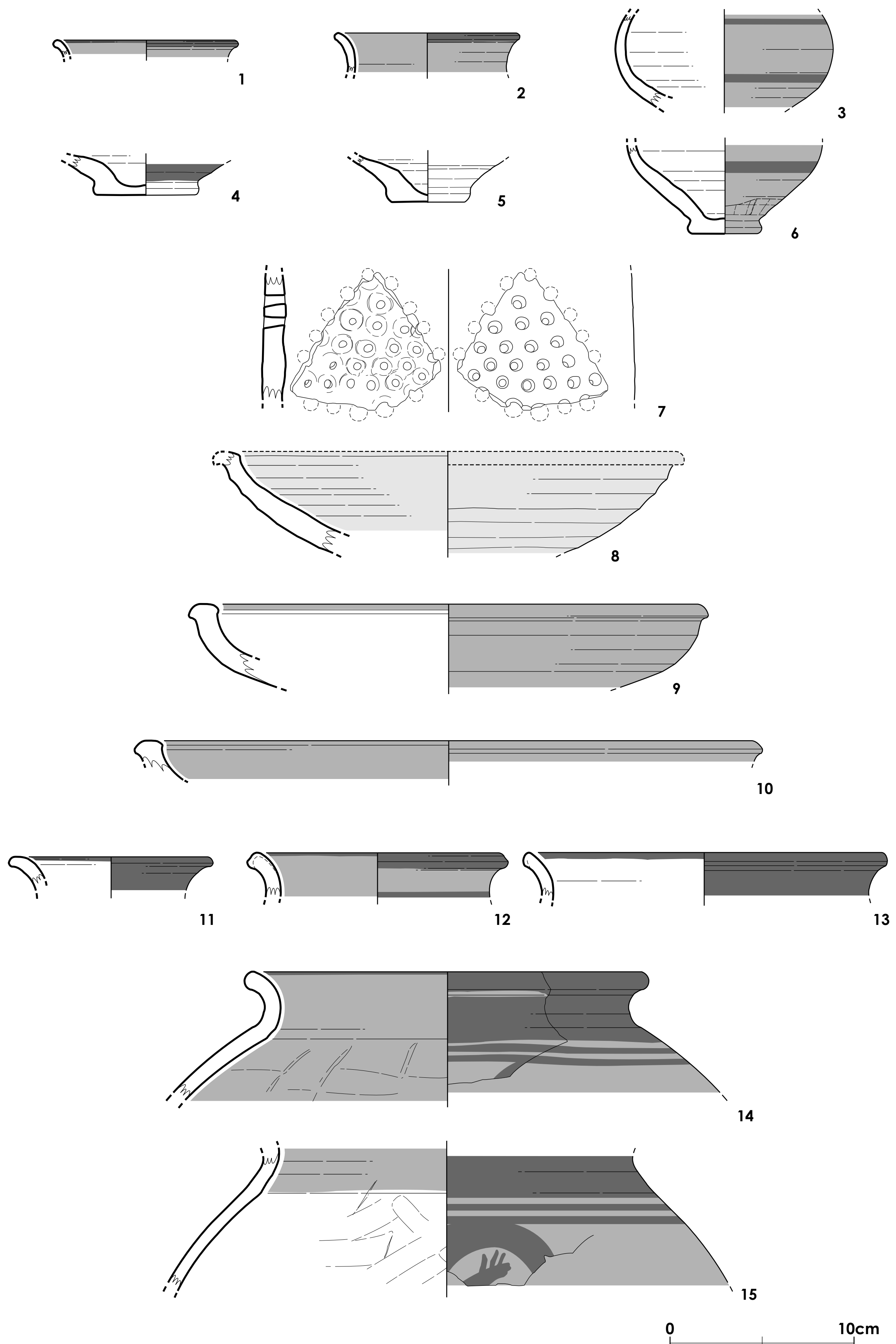


Figure 6.42 Pottery from Phase 1, Index Trench 1C11, Central Area (1:3)

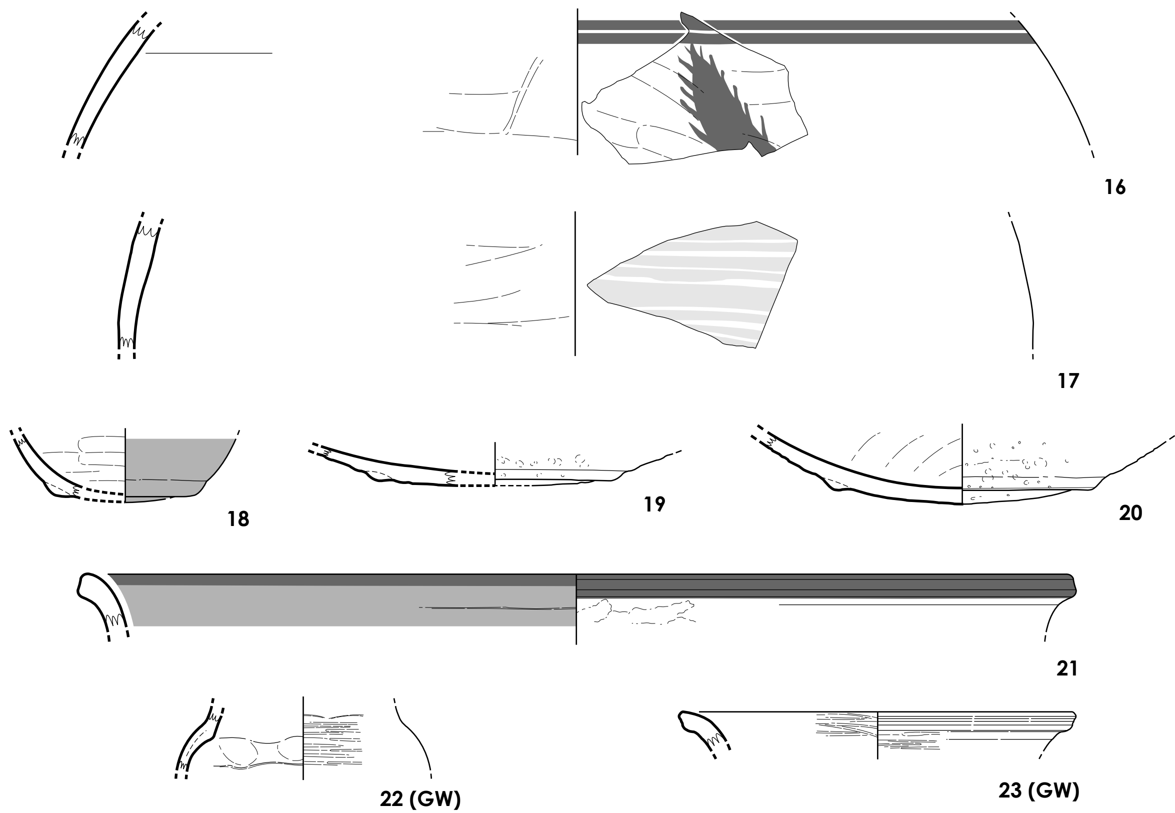


Figure 6.43 Pottery from Phase 1, Trench 1C11 (1:3)

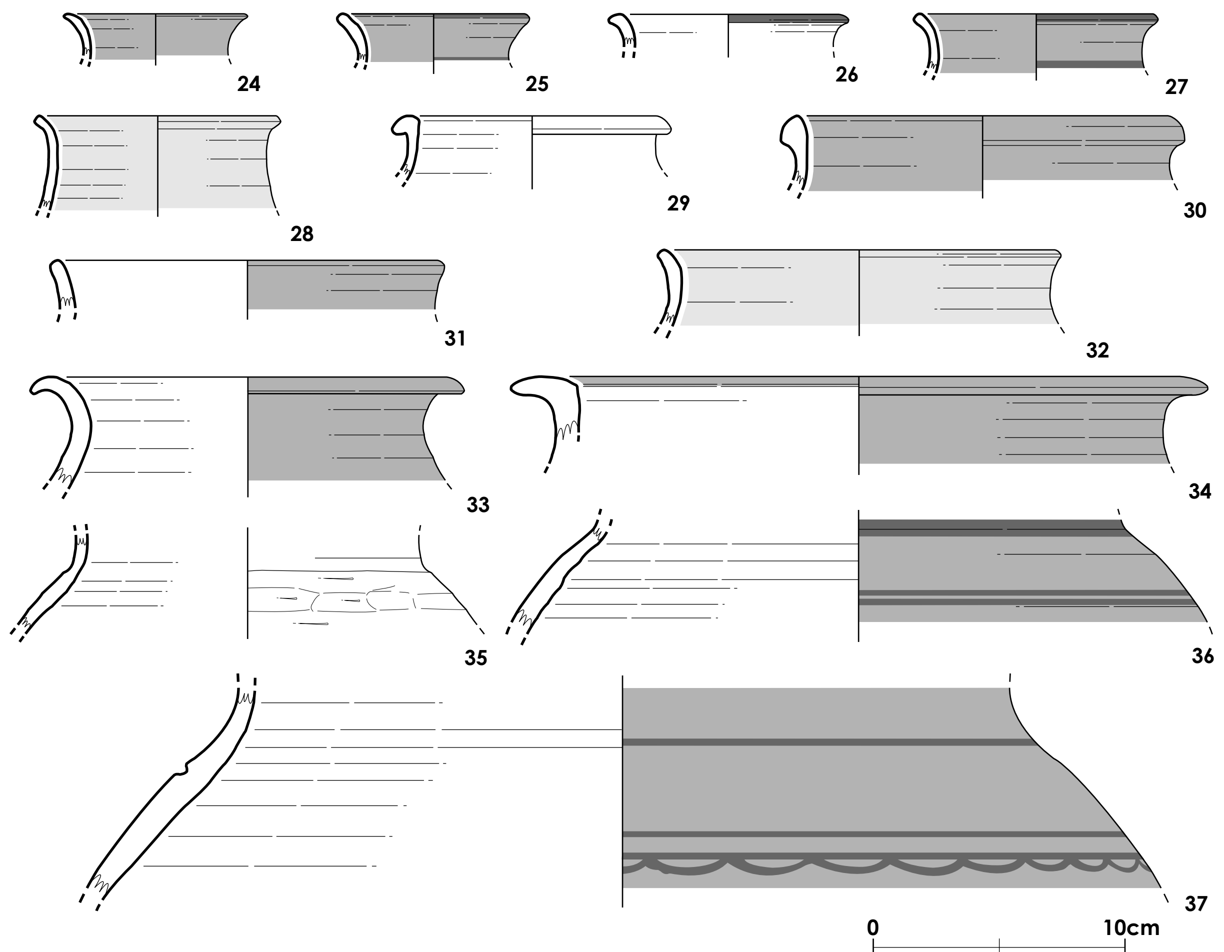


Figure 6.44 Pottery from Phase 2, Trench 1C11 (1:3)

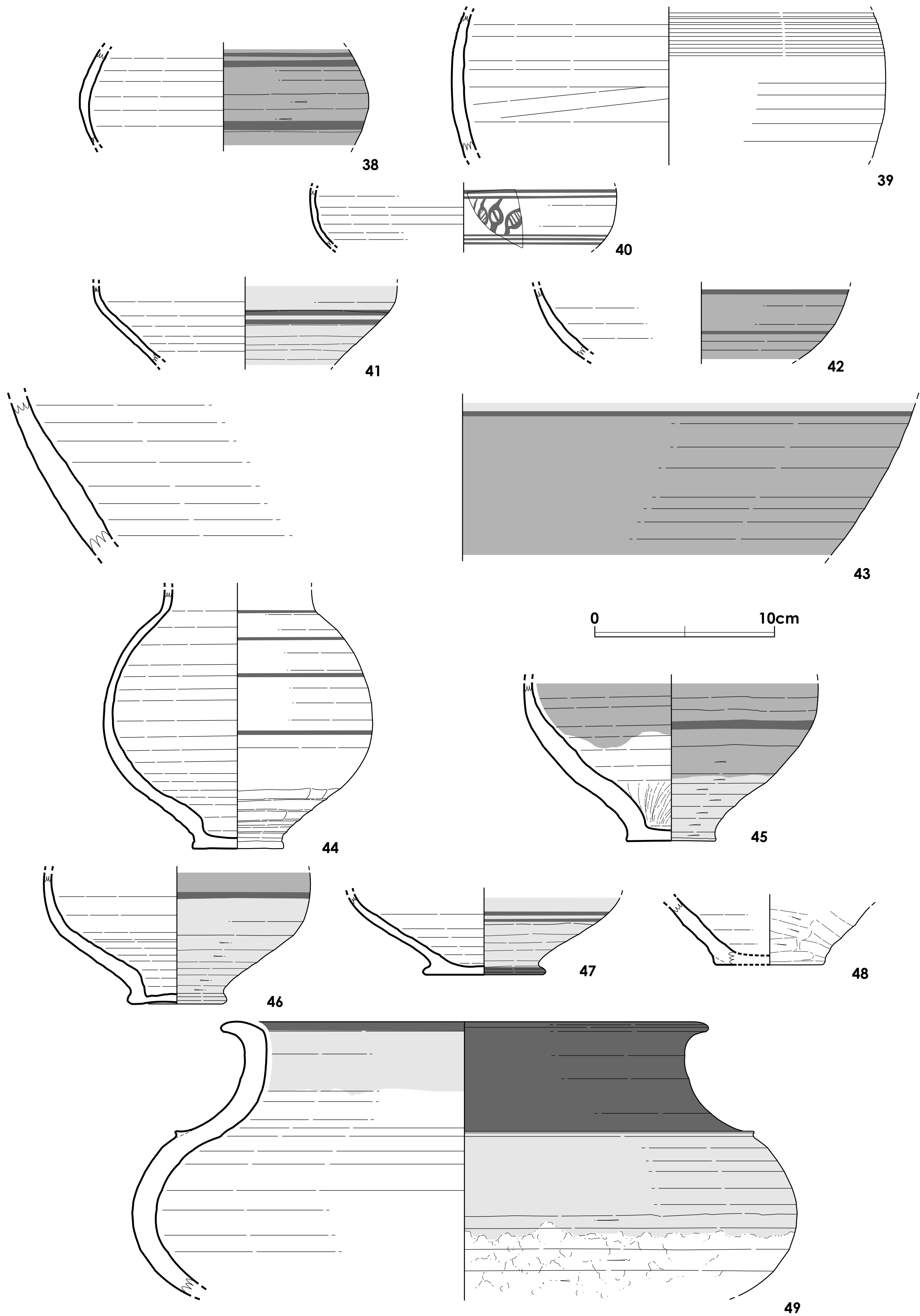


Figure 6.45 Pottery from Phase 2, Trench 1C11 (1:3)

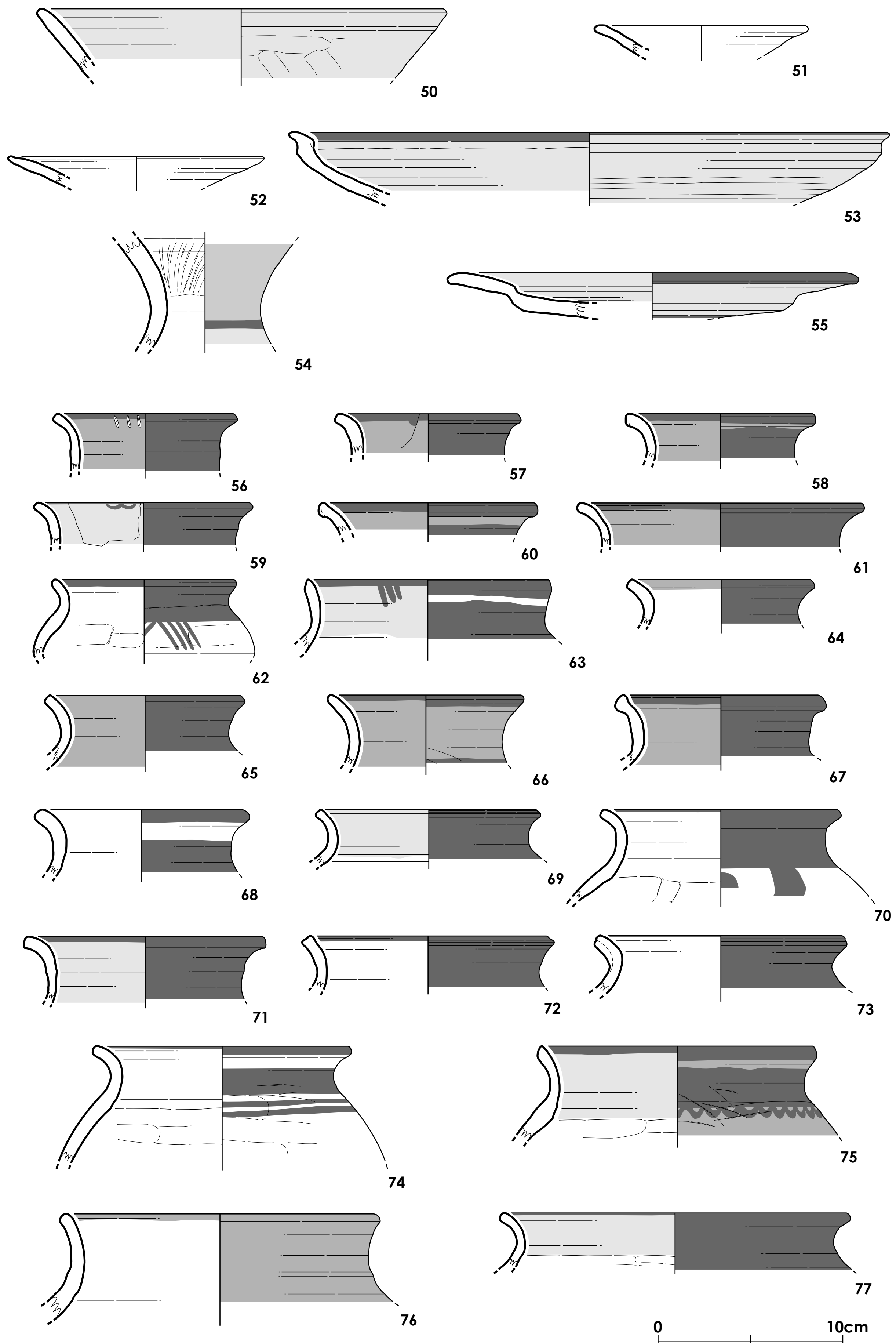


Figure 6.46 Pottery from Phase 2, Trench 1C11 (1:3)

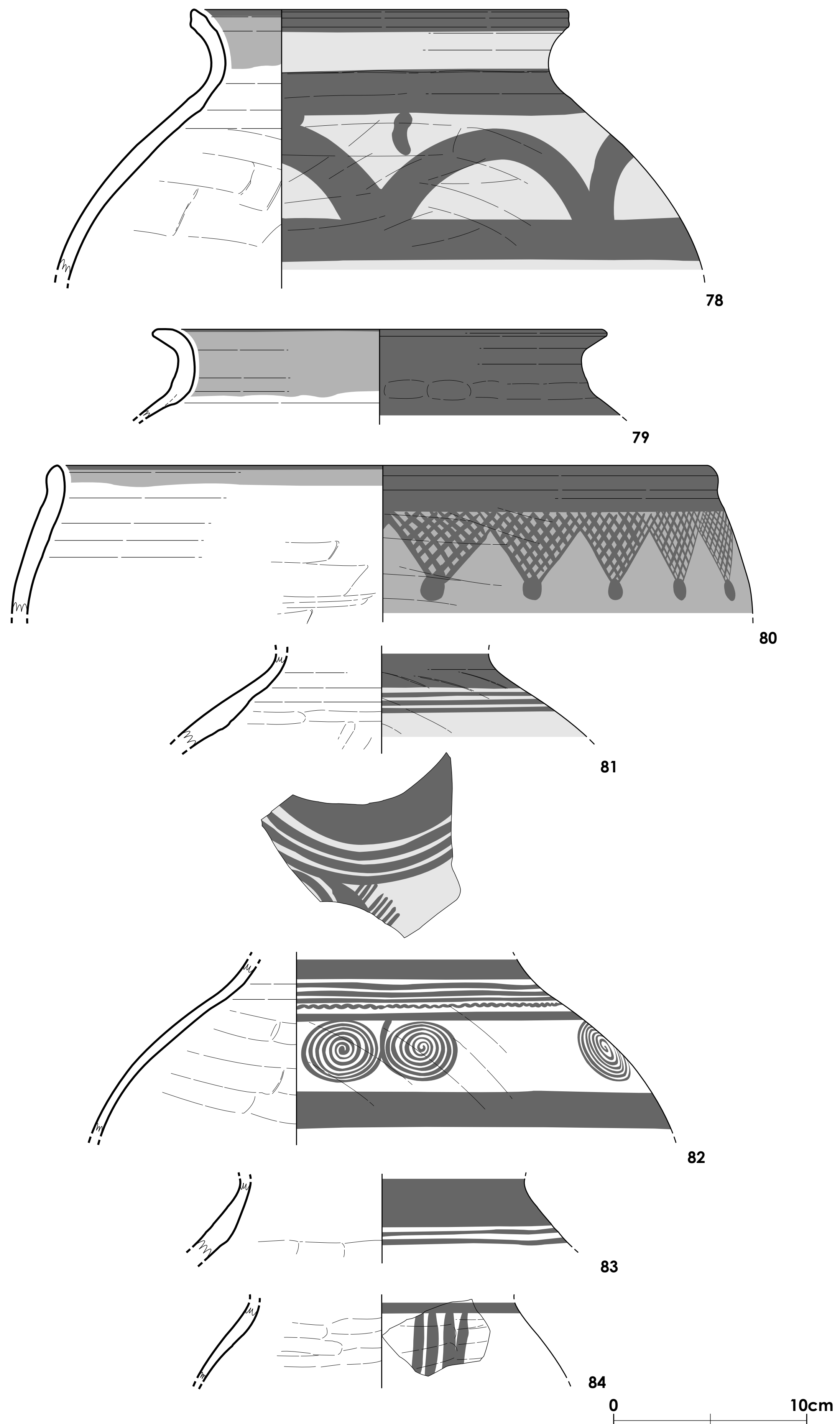


Figure 6.47 Pottery from Phase 2, Index Trench 1C11, Central Area (1:3)

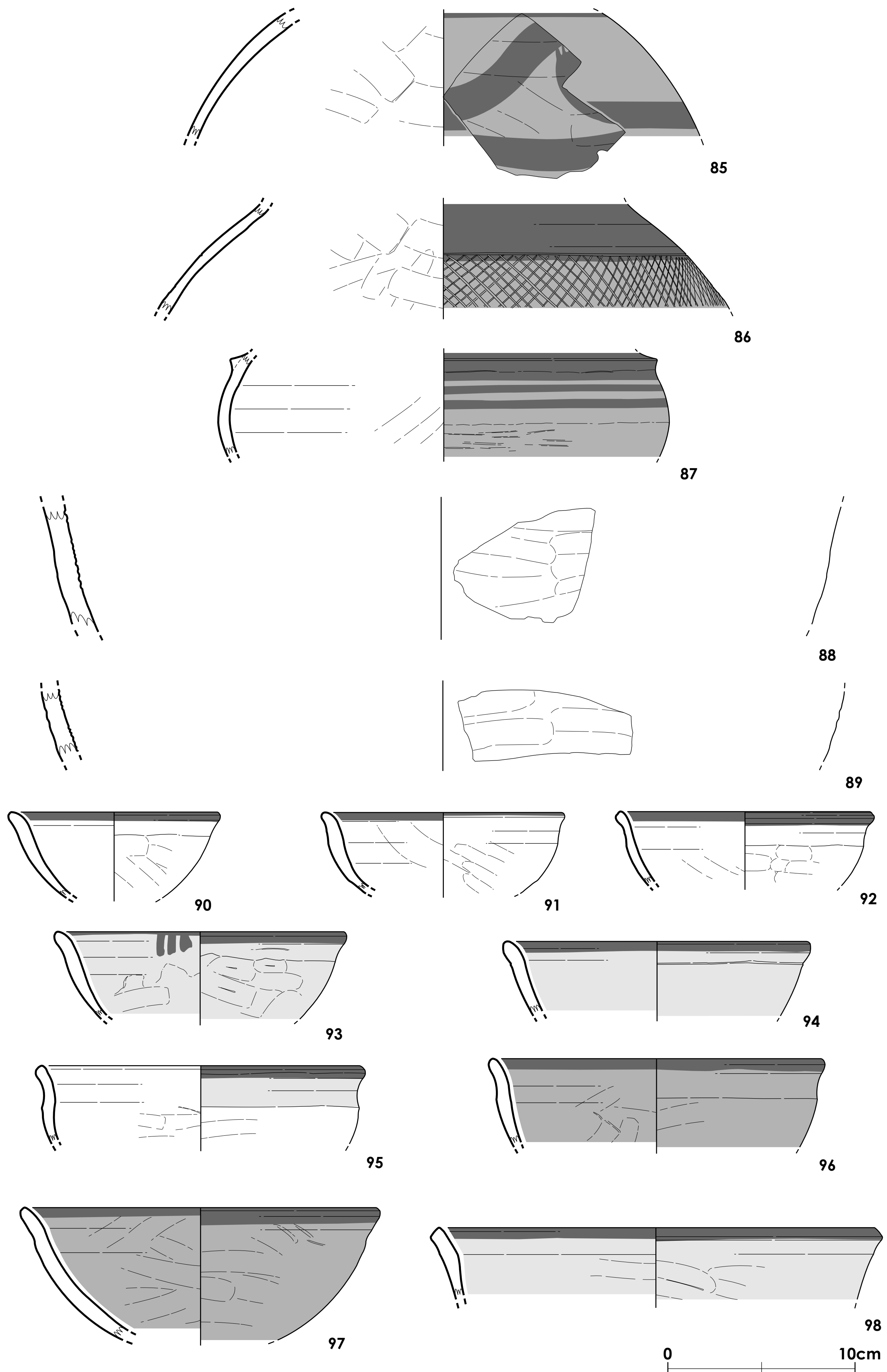


Figure 6.48 Pottery from Phase 2, Index Trench 1C11, Central Area (1:3)

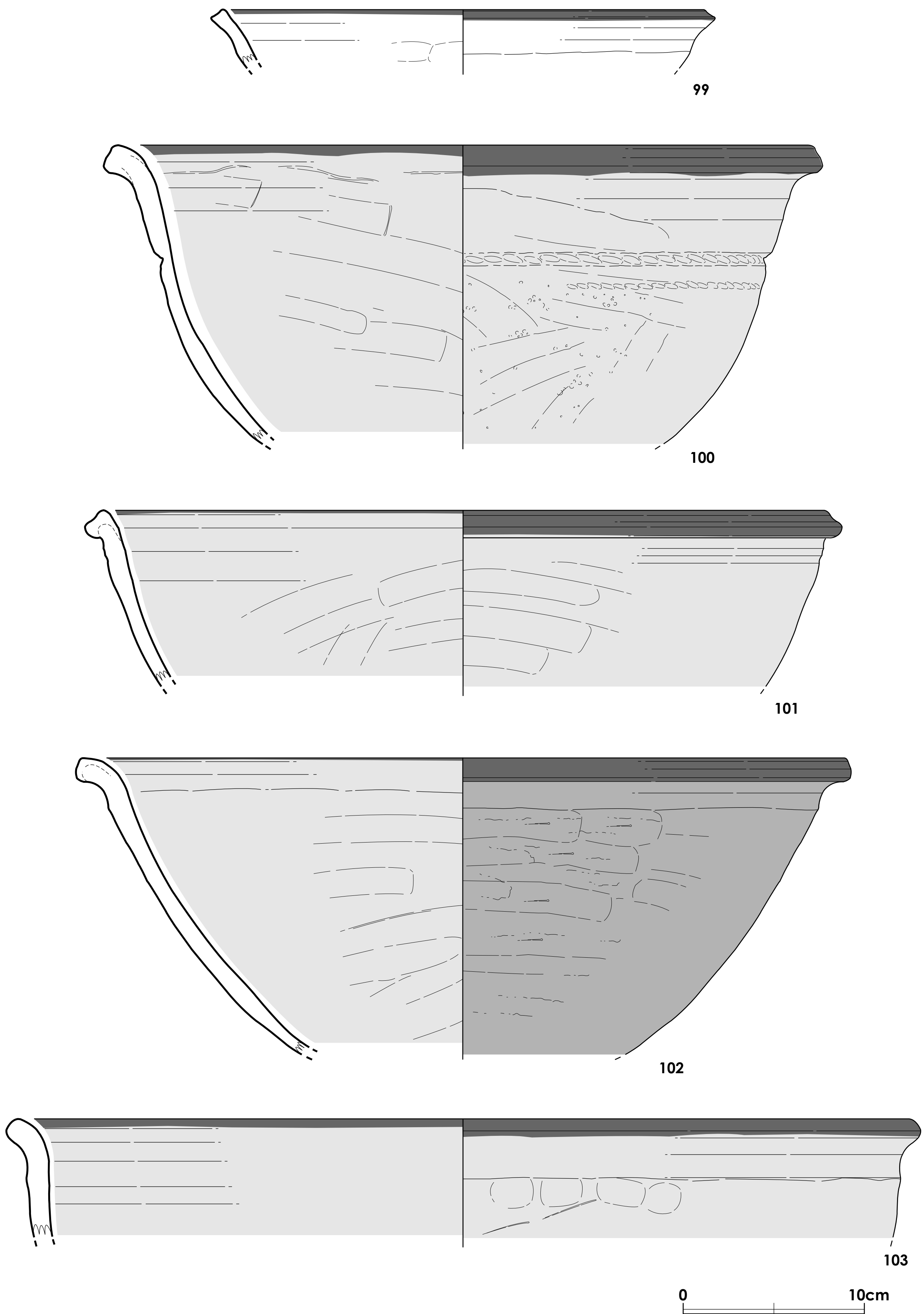


Figure 6.49 Pottery from Phase 2, Index Trench 1C11, Central Area (1:3)

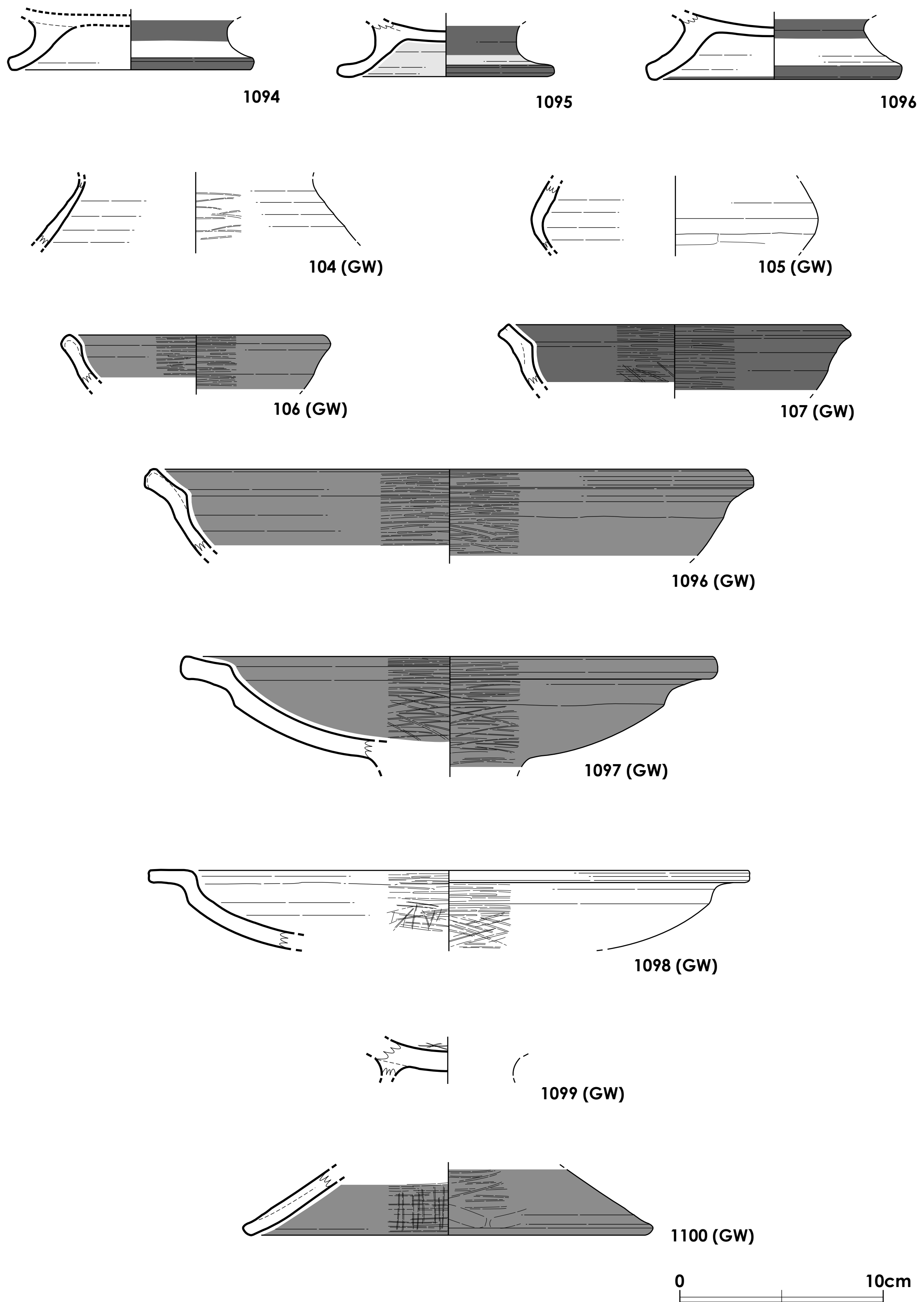


Figure 6.50 Pottery from Phase 2, Index Trench 1C11, Central Area (1:3)

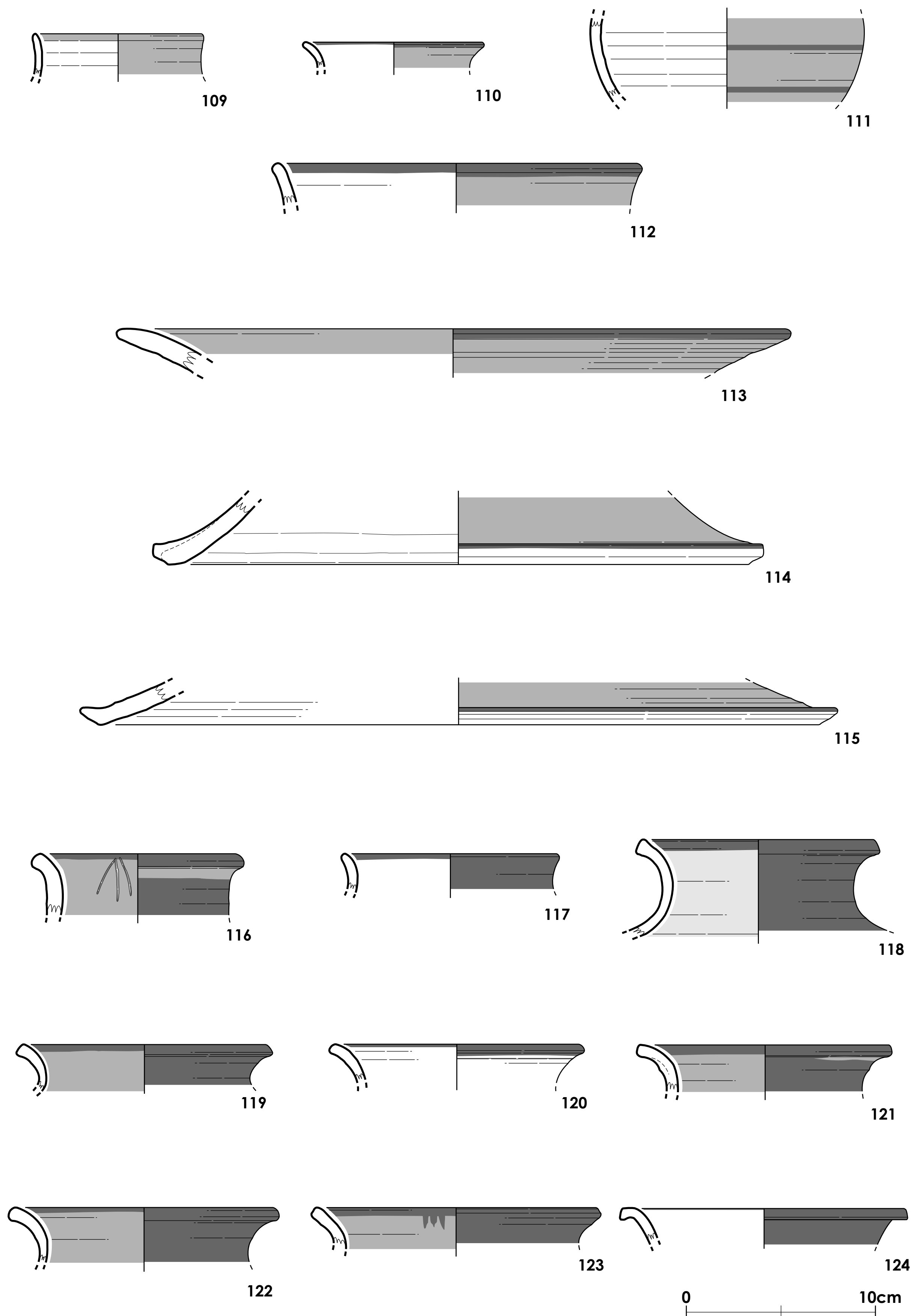


Figure 6.51 Pottery from Phase 3, Index Trench 1C11, Central Area (1:3)

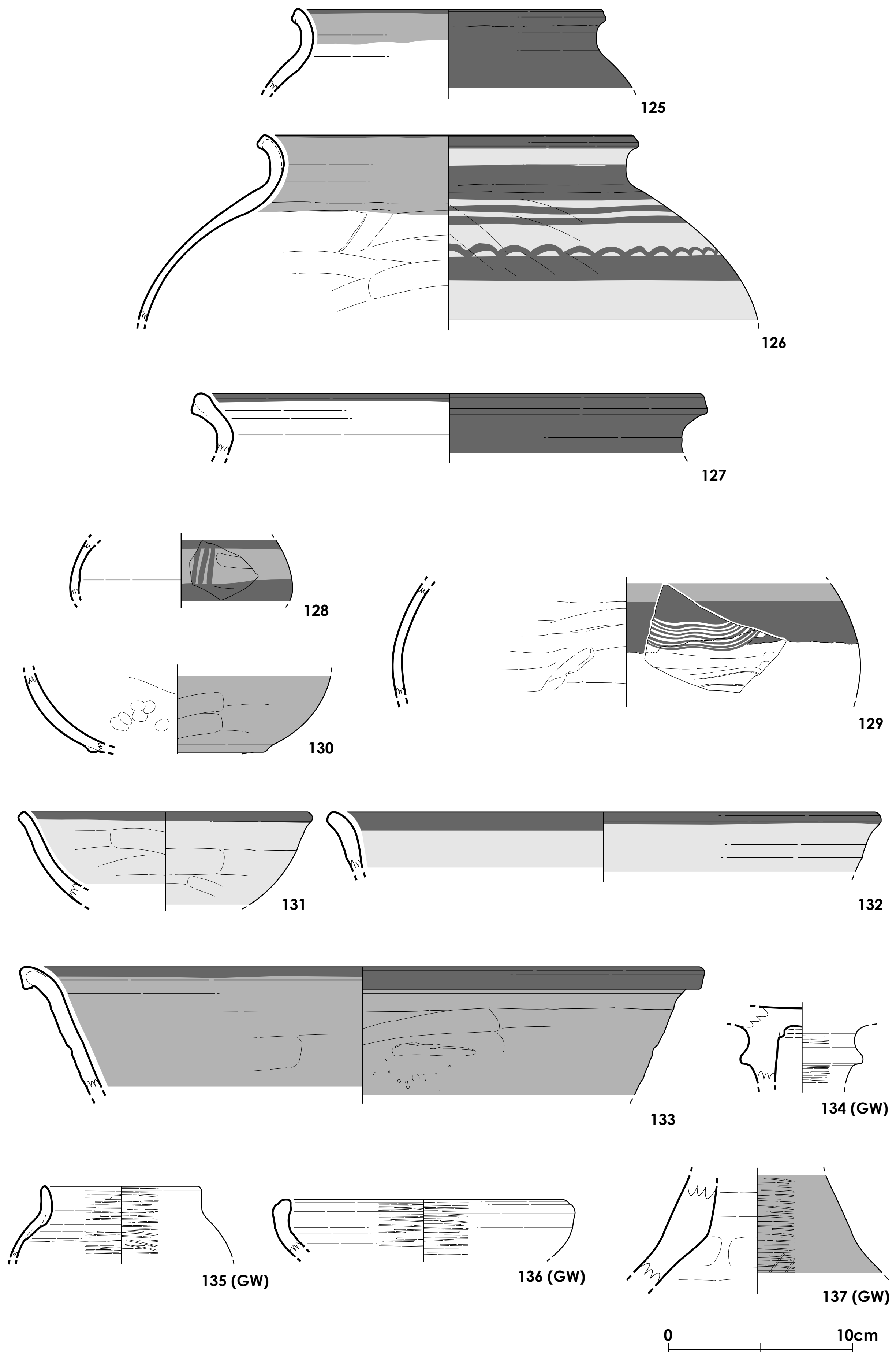


Figure 6.52 Pottery from Phase 3, Index Trench 1C11, Central Area (1:3)

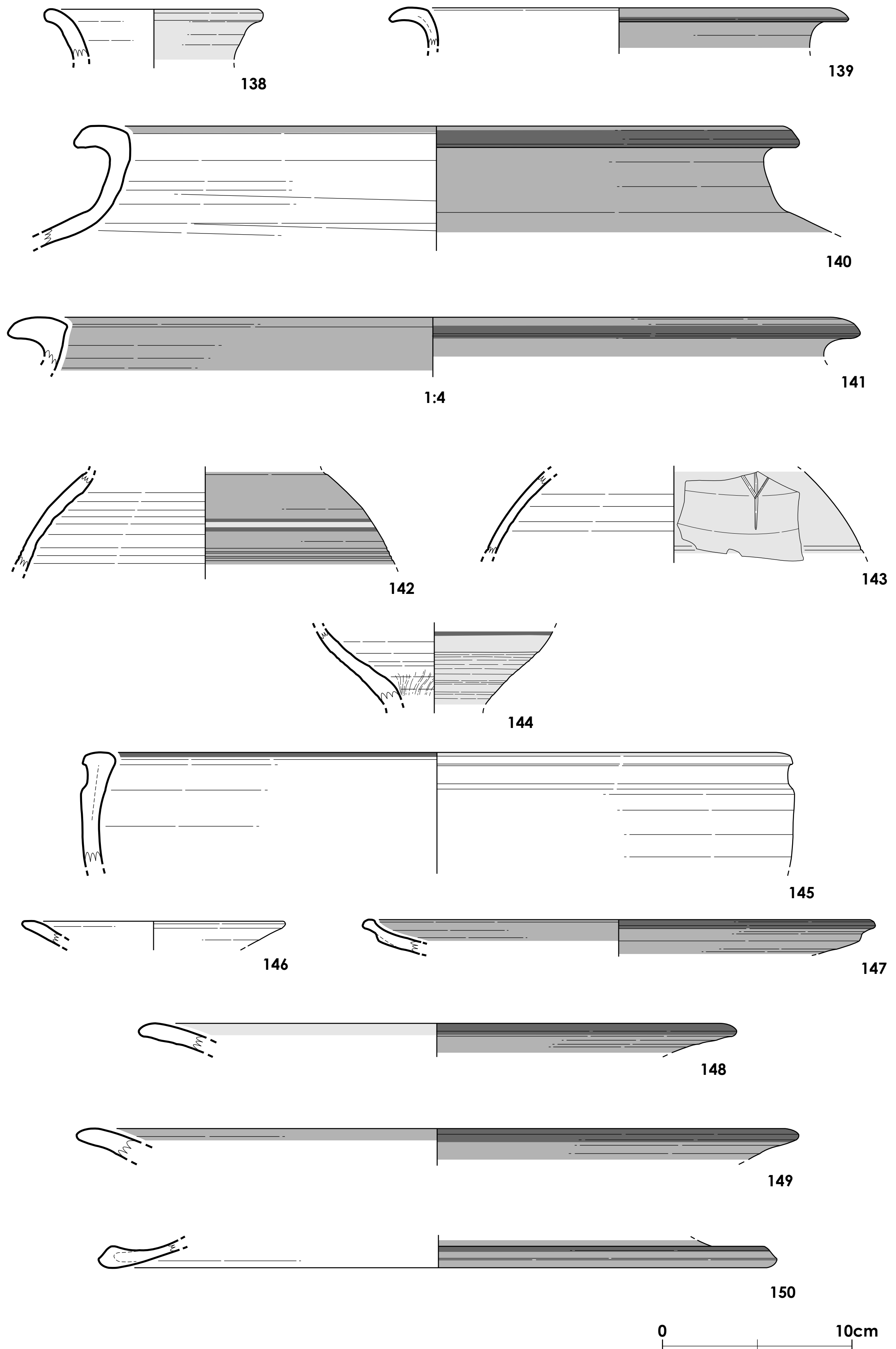


Figure 6.53 Pottery from Phase 4, Index Trench 1C11, Central Area (1:3)

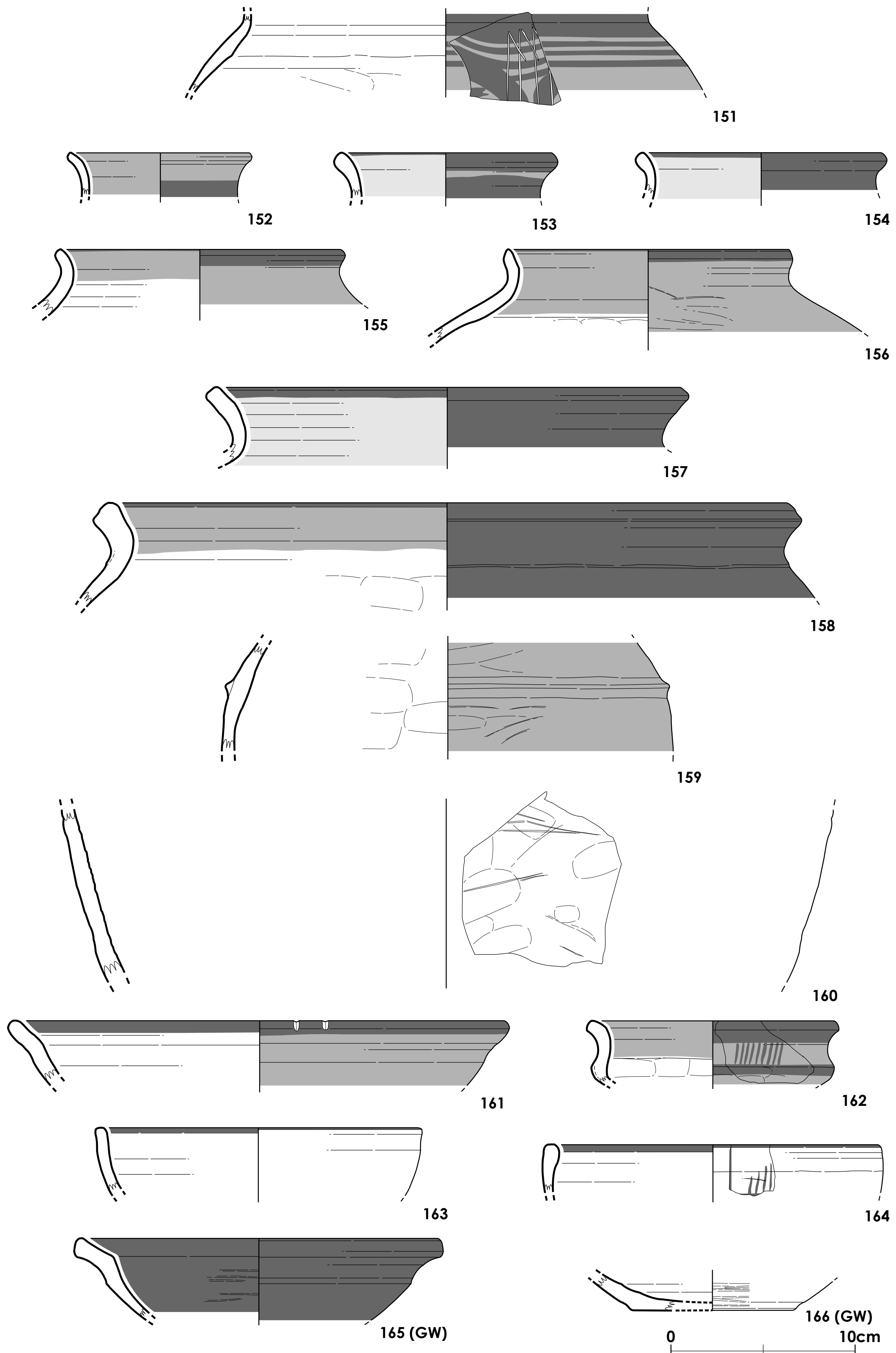


Figure 6.54 Pottery from Phase 4, Index Trench 1C11, Central Area (1:3)

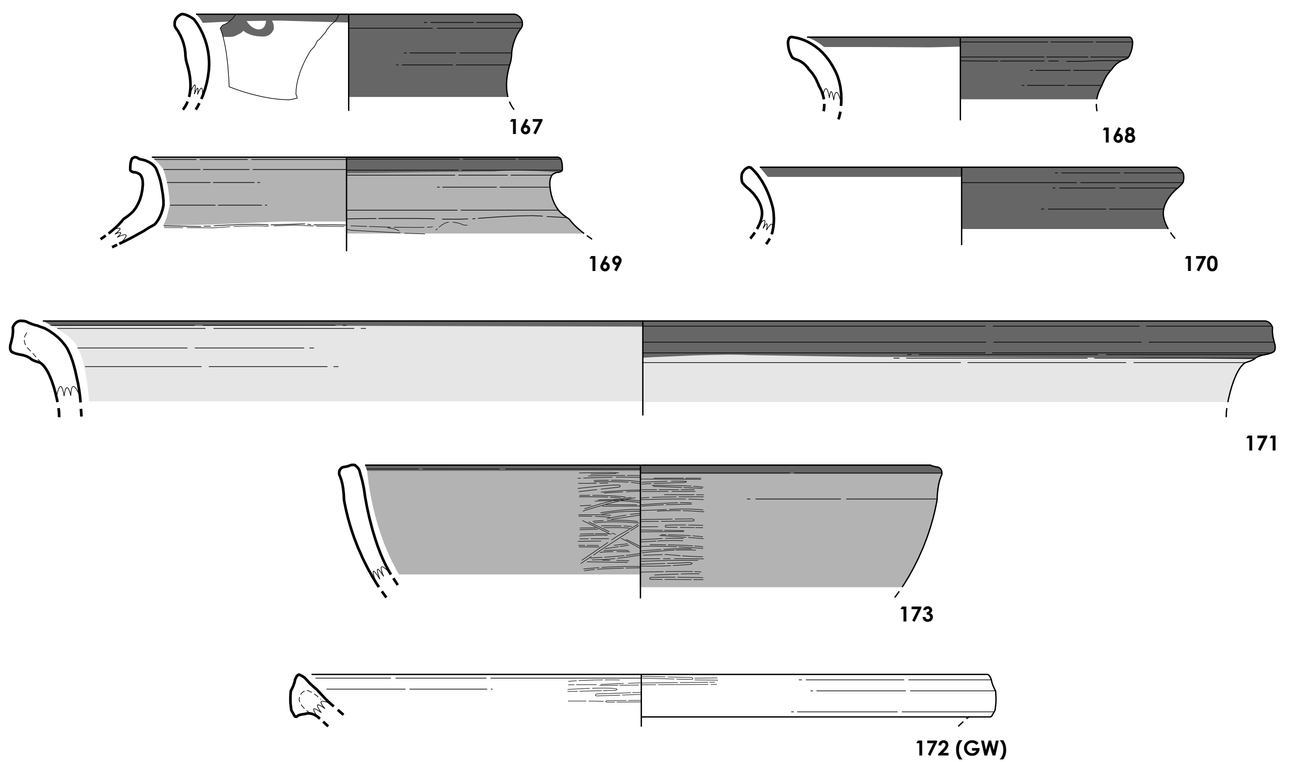


Figure 6.55 Pottery from Phase 5, Index Trench 1C11, Central Area (1:3)

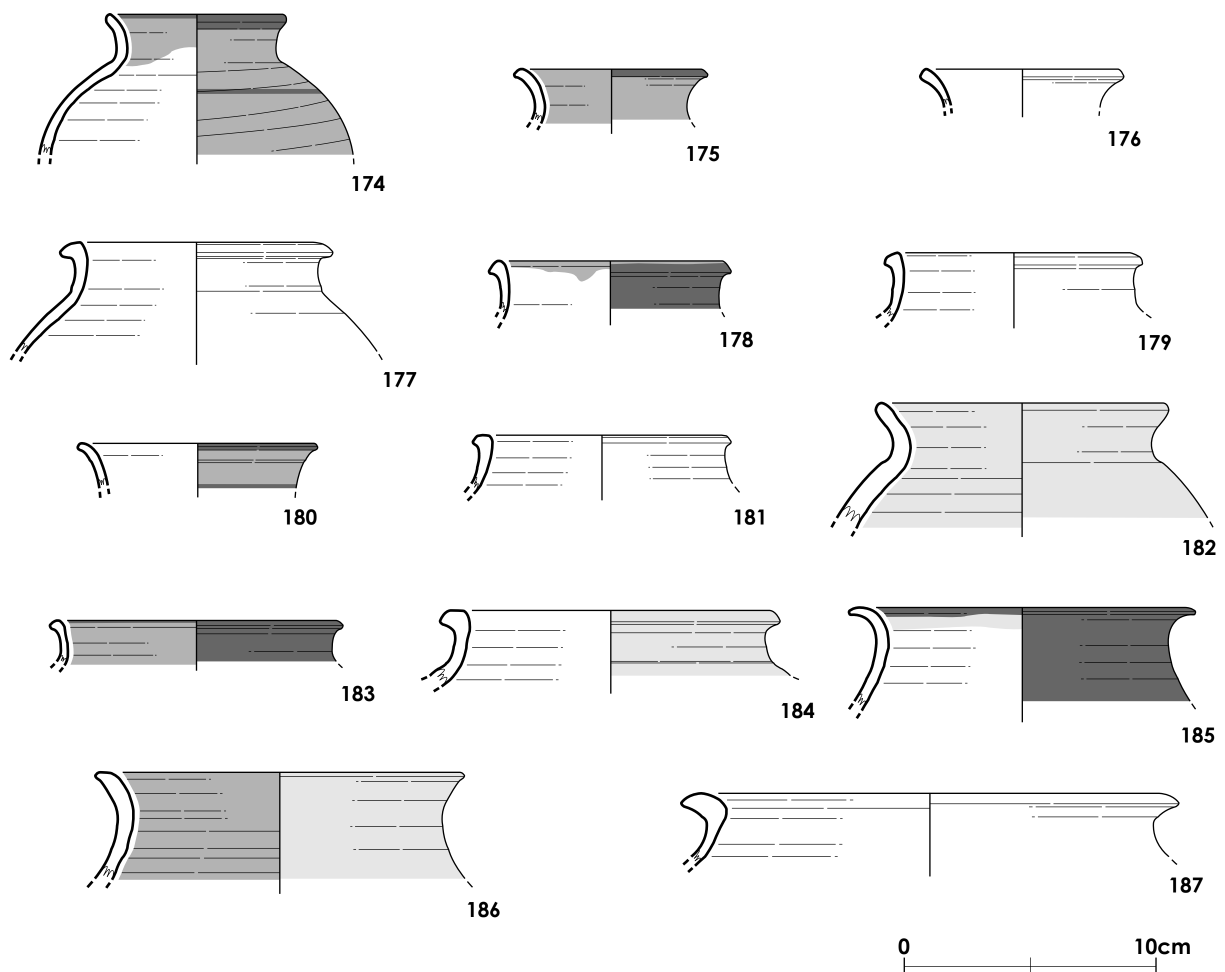


Figure 6.56 Pottery from Phase 2, Index Trench 1D5, Central Area (1:3)

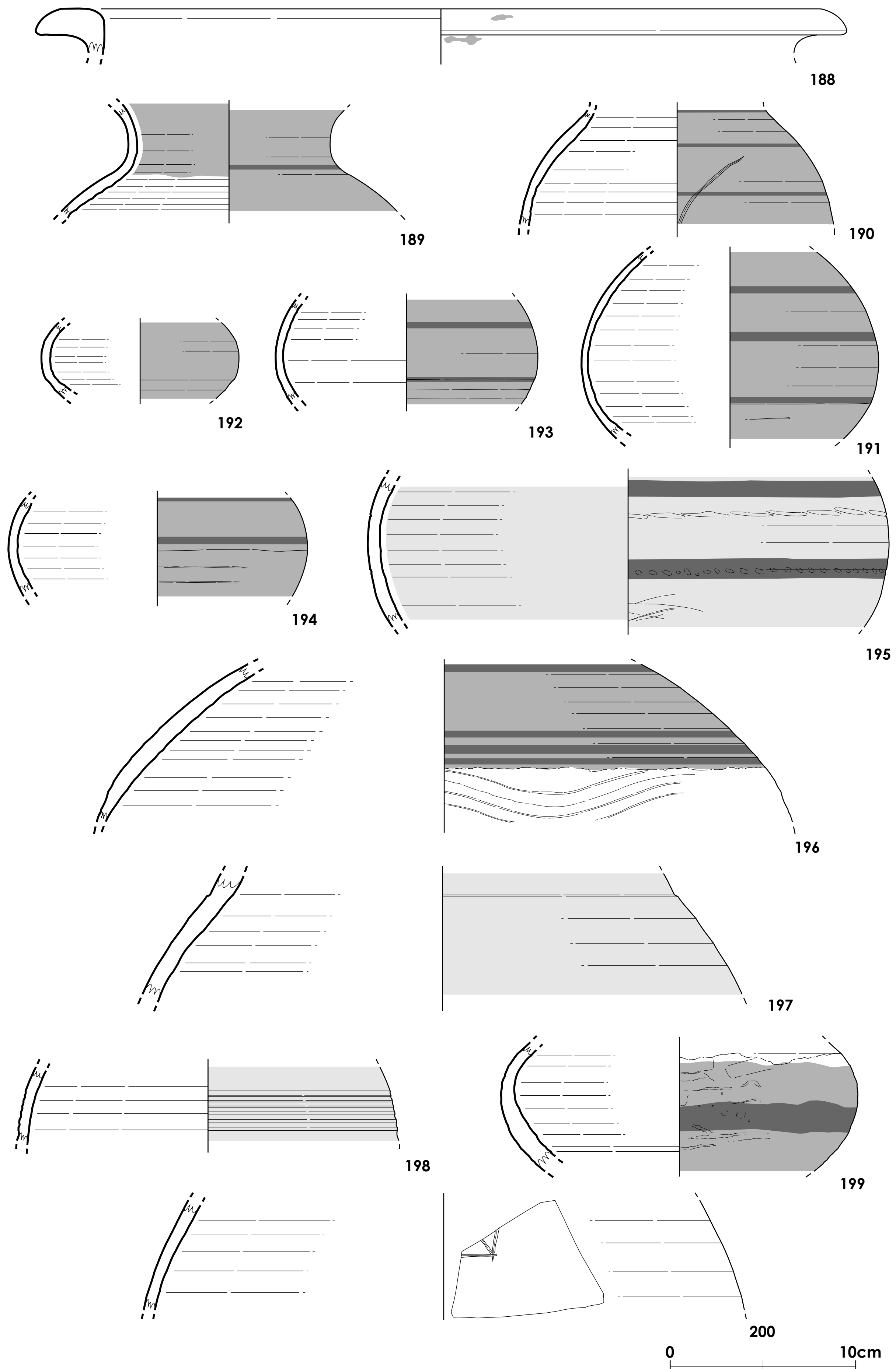


Figure 6.57 Pottery from Phase 2, Index Trench 1D5, Central Area (1:3)

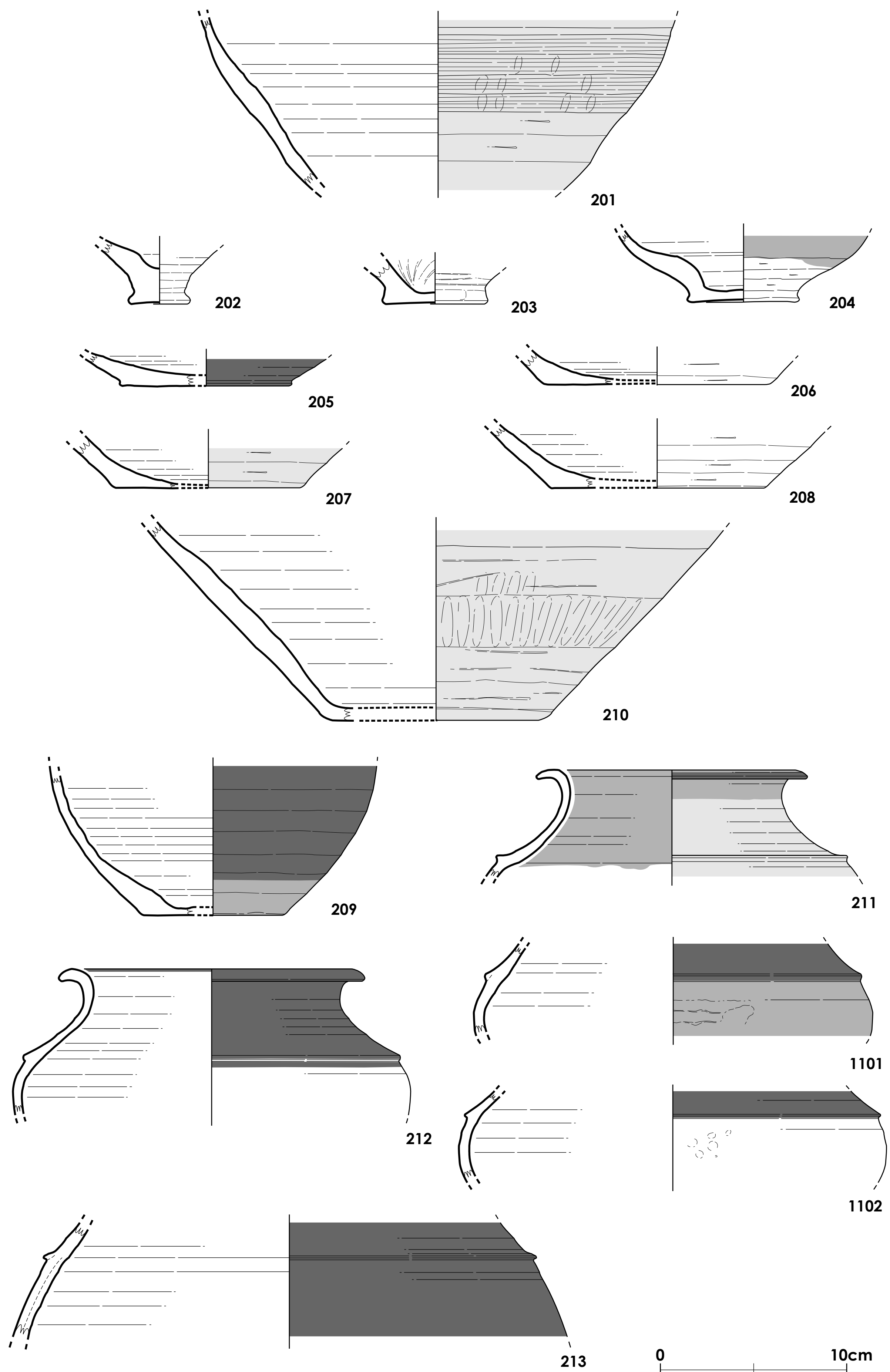


Figure 6.58 Pottery from Phase 2, Index Trench 1D5, Central Area (1:3)

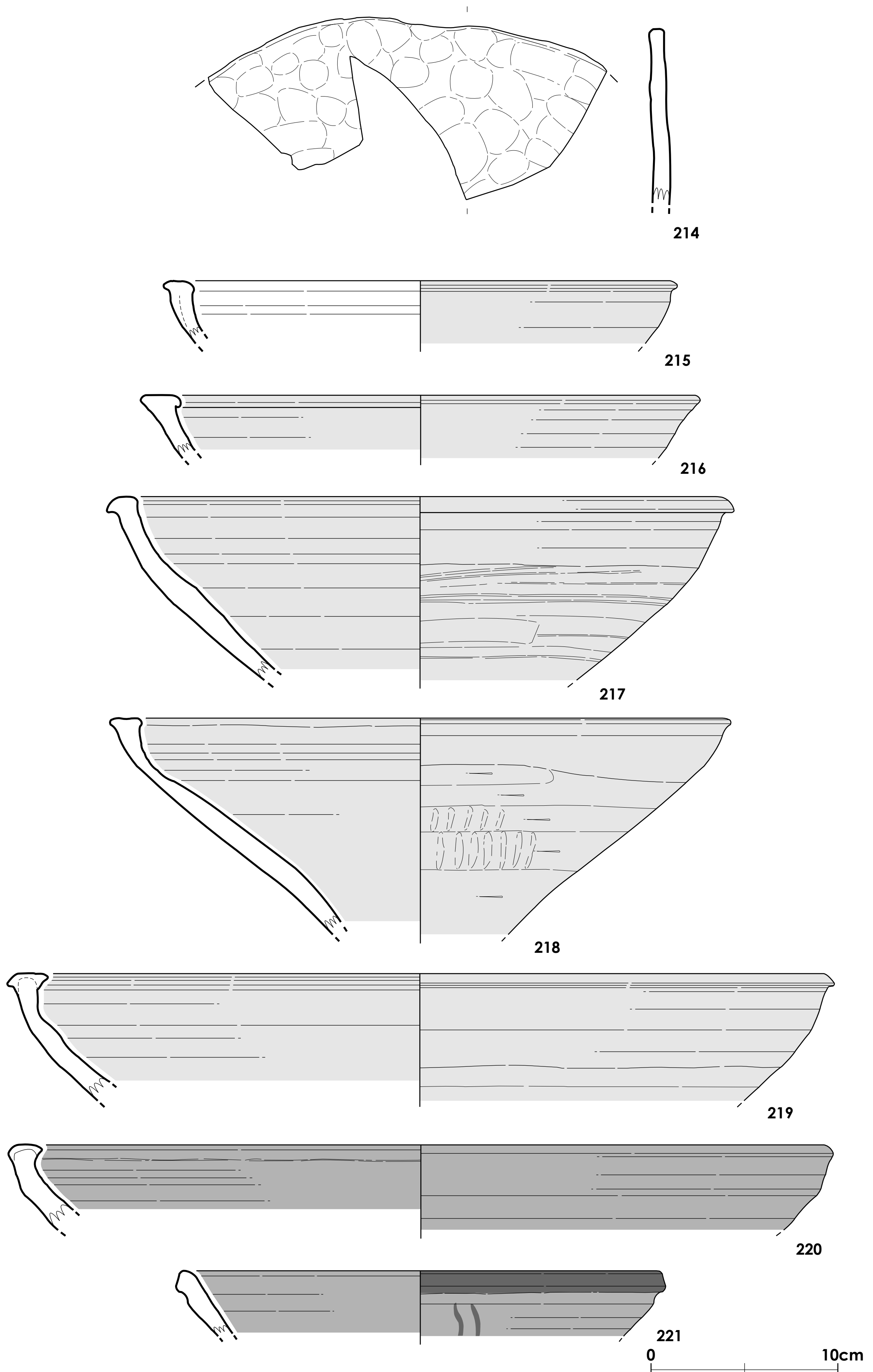


Figure 6.59 Pottery from Phase 2, Index Trench 1D5, Central Area (1:3)

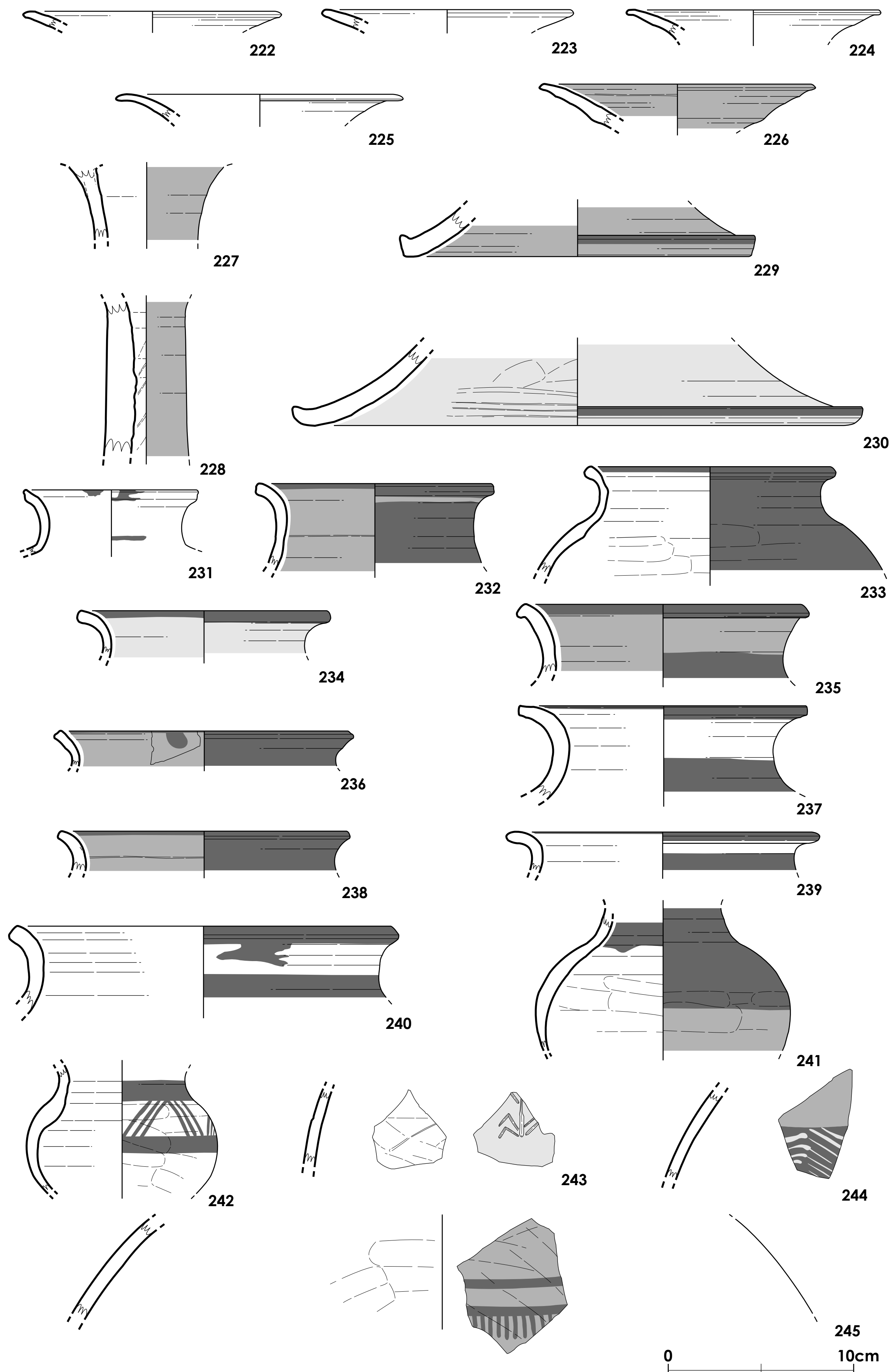


Figure 6.60 Pottery from Phase 2, Index Trench 1D5, Central Area (1:3)

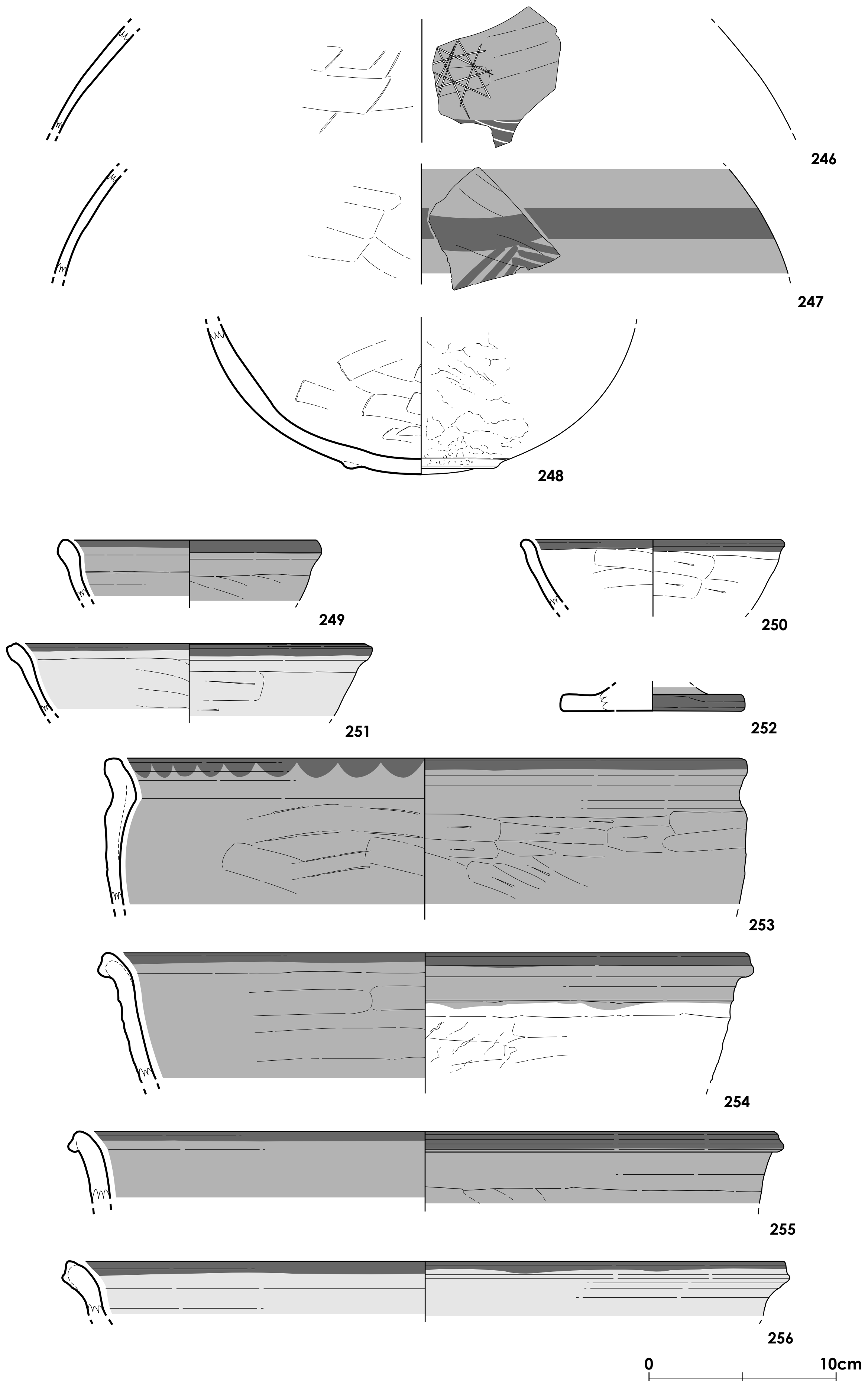


Figure 6.61 Pottery from Phase 2, Index Trench 1D5, Central Area (1:3)

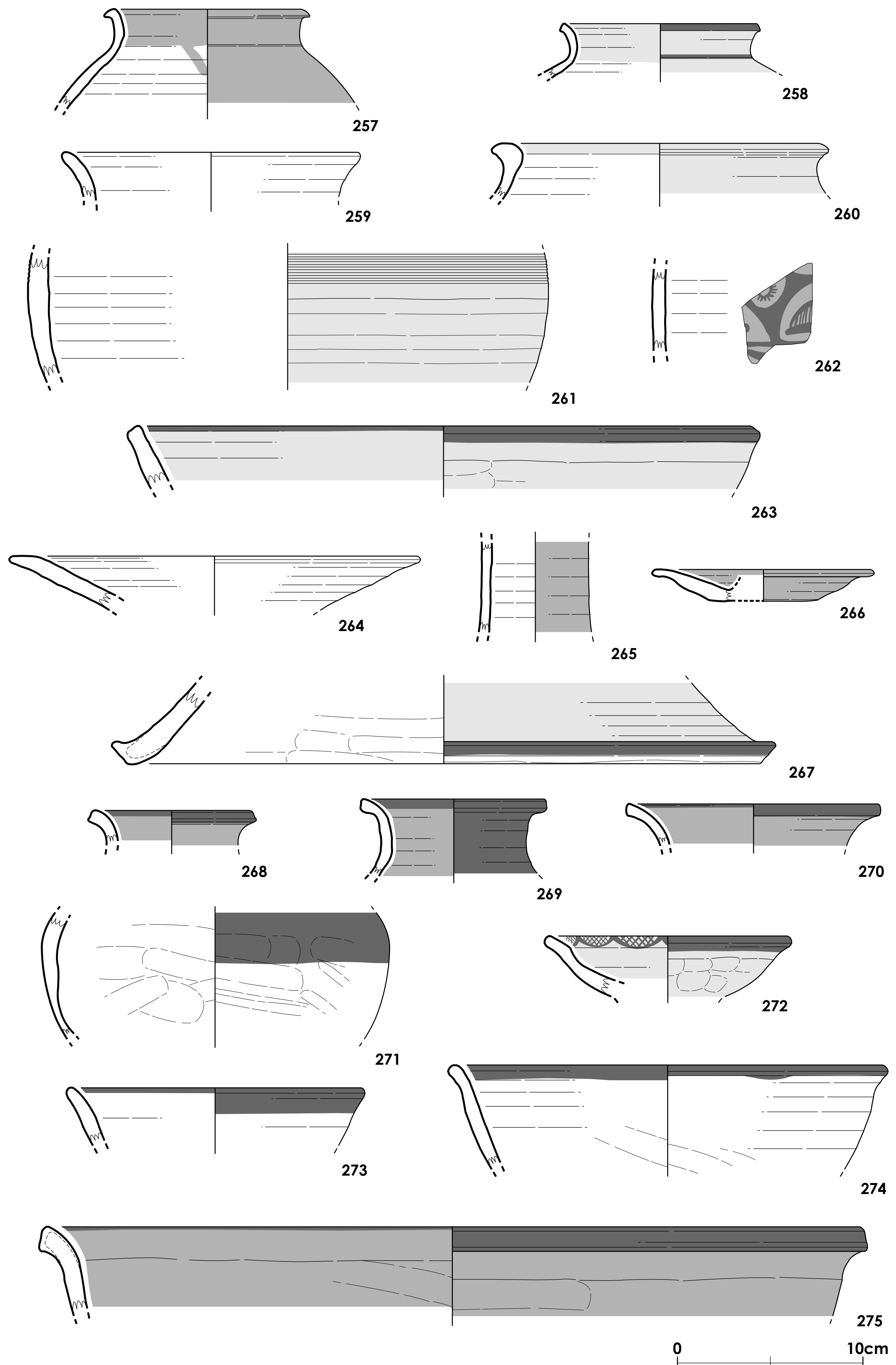


Figure 6.62 Pottery from Phase 3, Index Trench 1D5, Central Area (1:3)

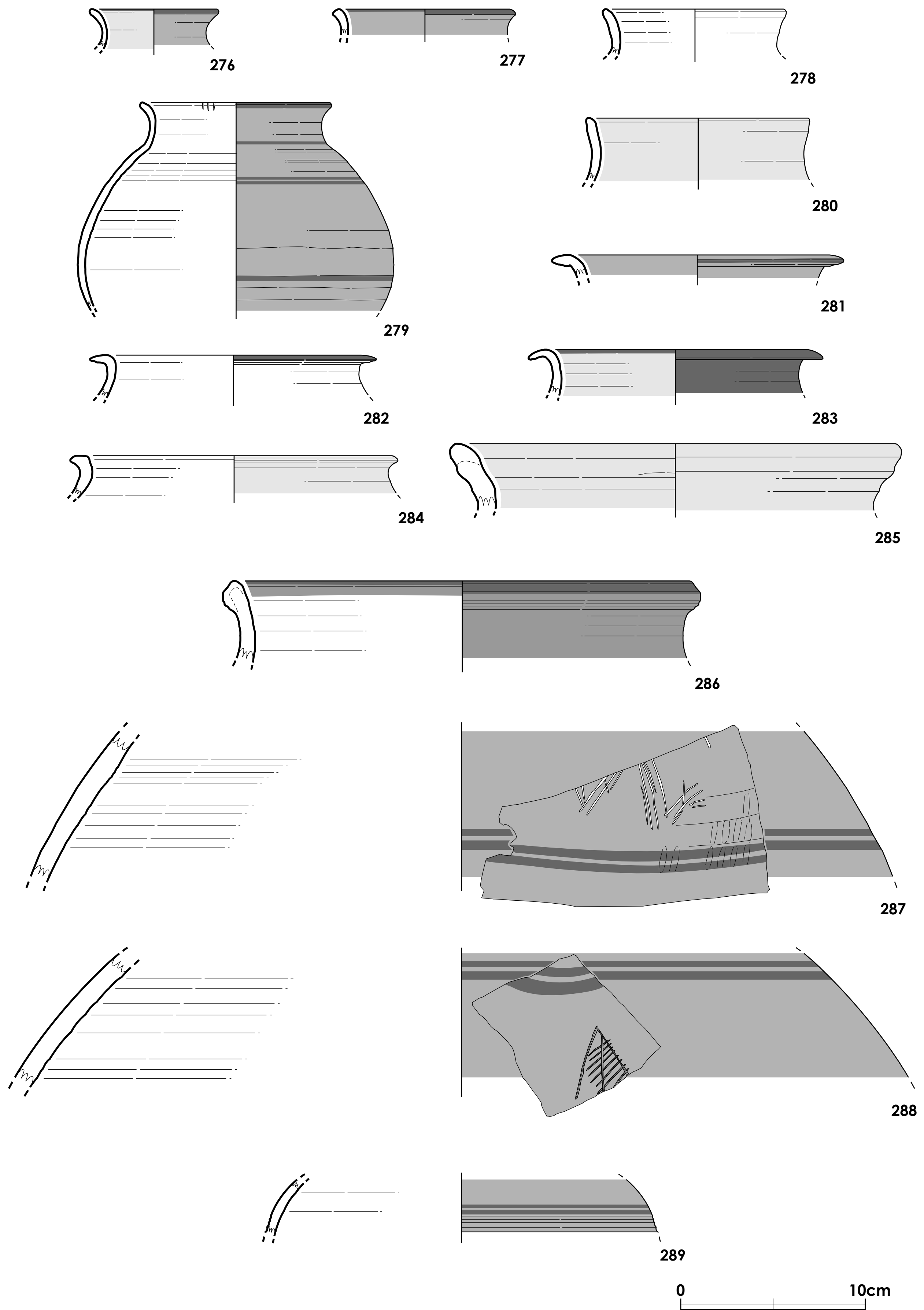


Figure 6.63 Pottery from Phase 4, Index Trench 1D5, Central Area (1:3)

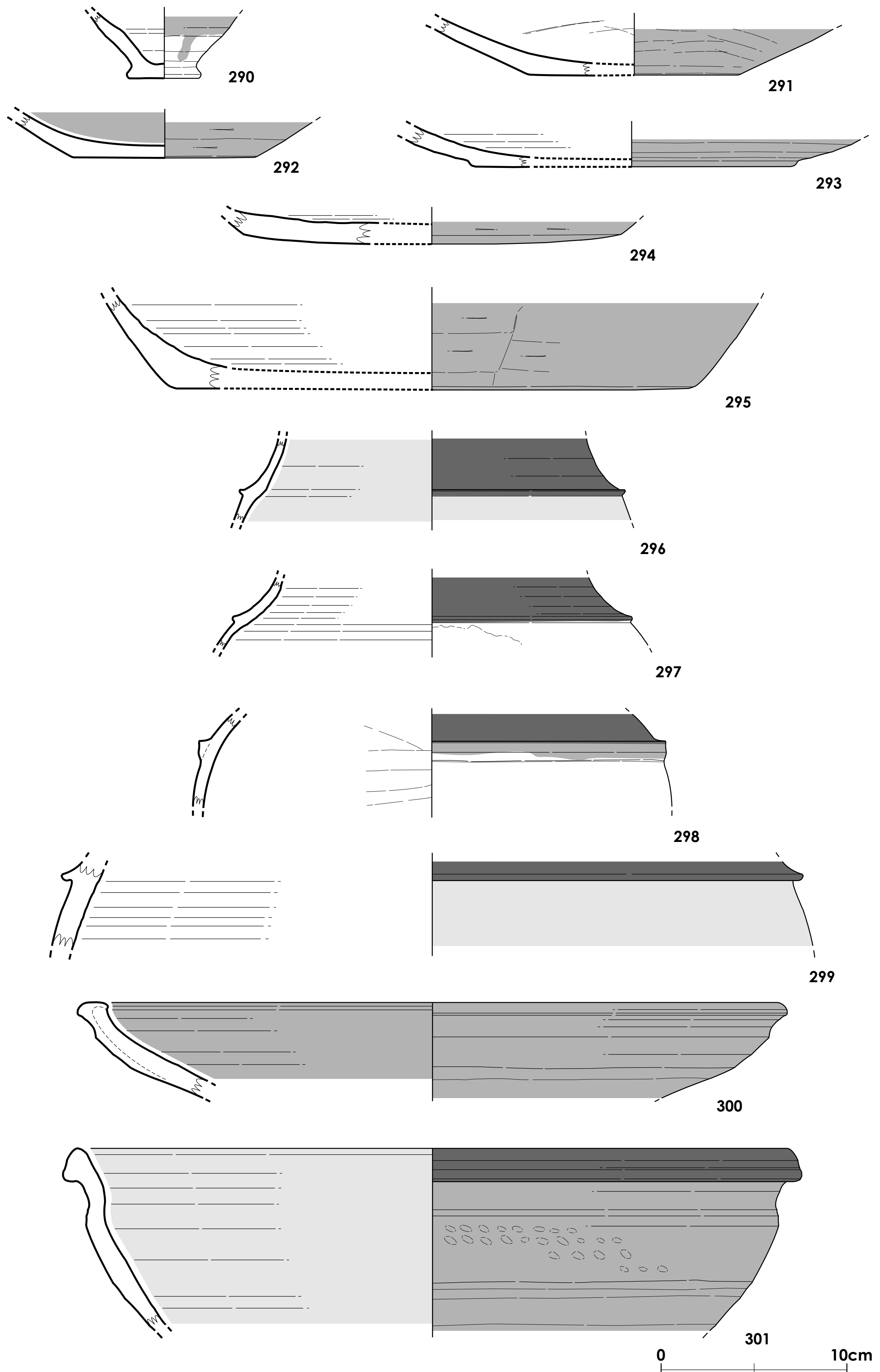


Figure 6.64 Pottery from Phase 4, Index Trench 1D5, Central Area (1:3)

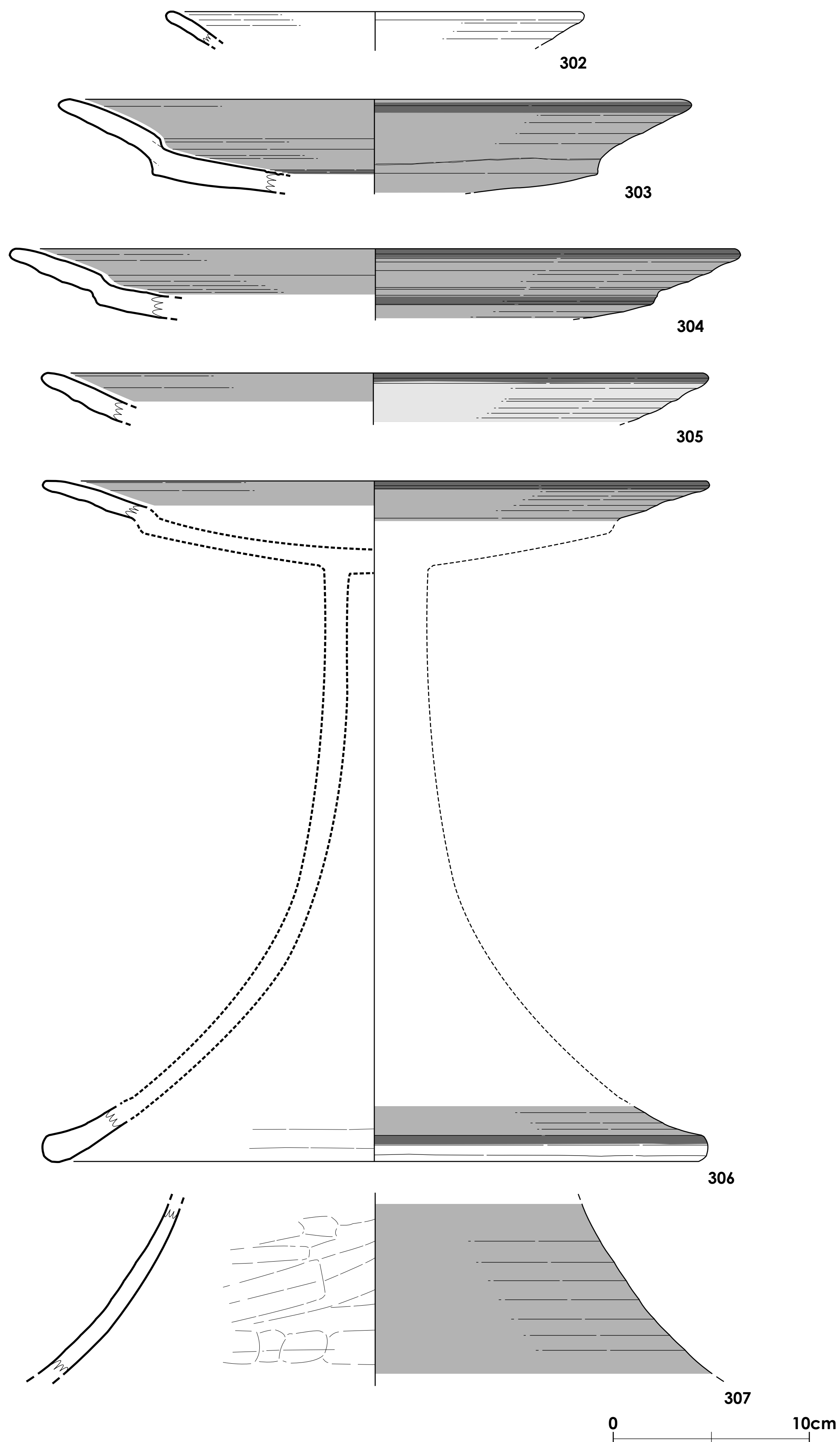


Figure 6.65 Pottery from Phase 4, Index Trench 1D5, Central Area (1:3)

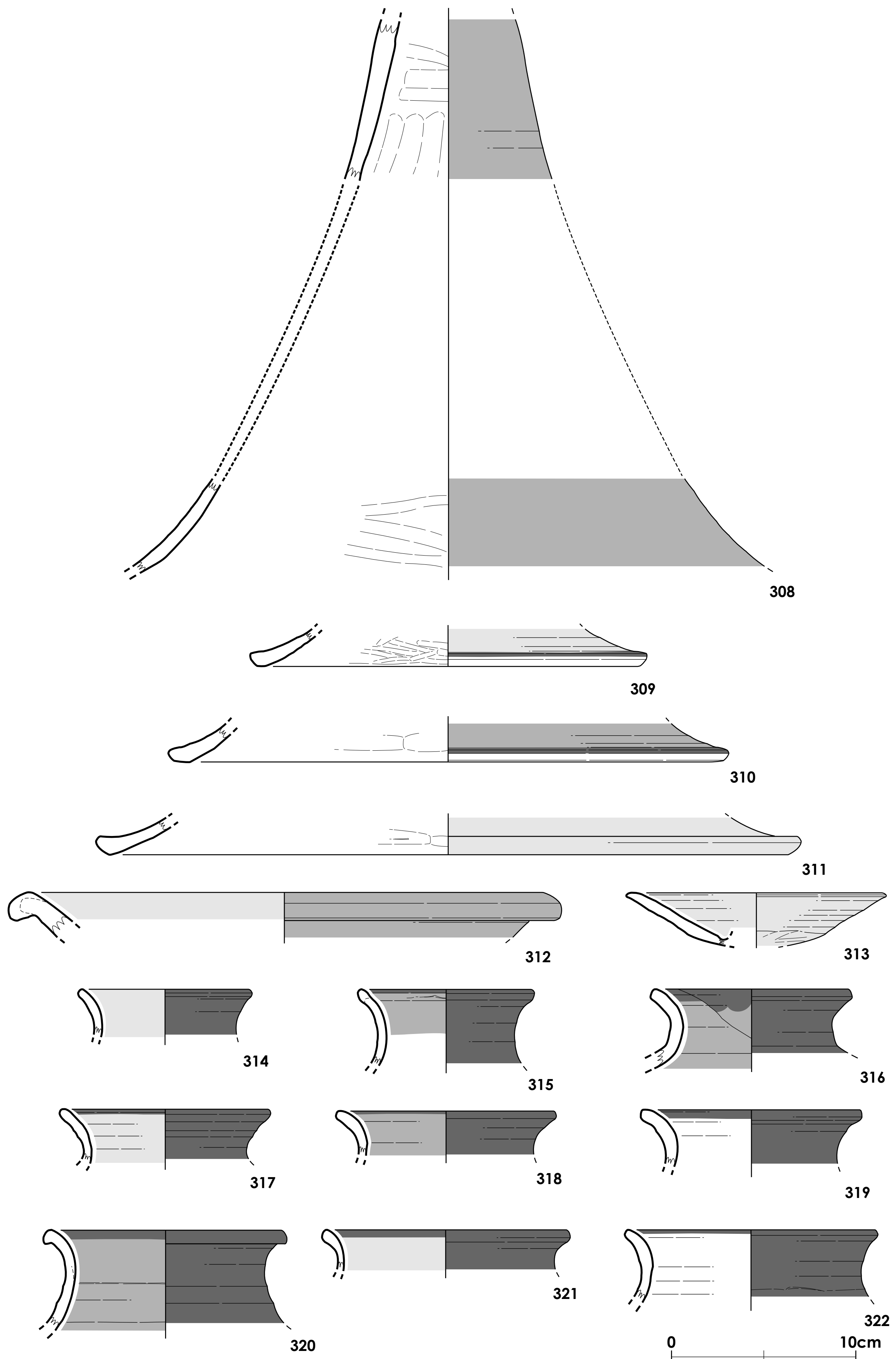


Figure 6.66 Pottery from Phase 4, Index Trench 1D5, Central Area (1:3)

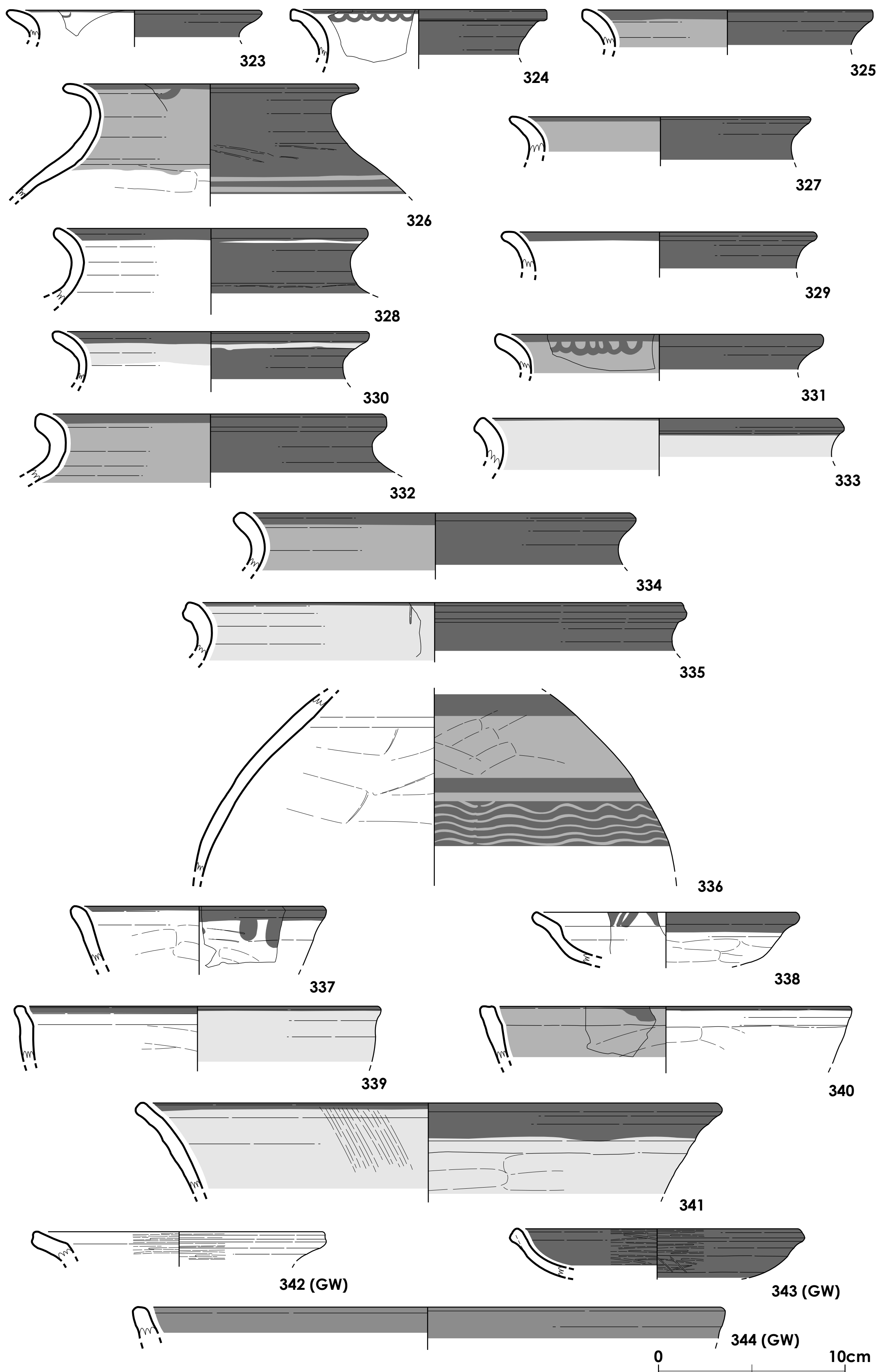


Figure 6.67 Pottery from Phase 4, Index Trench 1D5, Central Area (1:3)

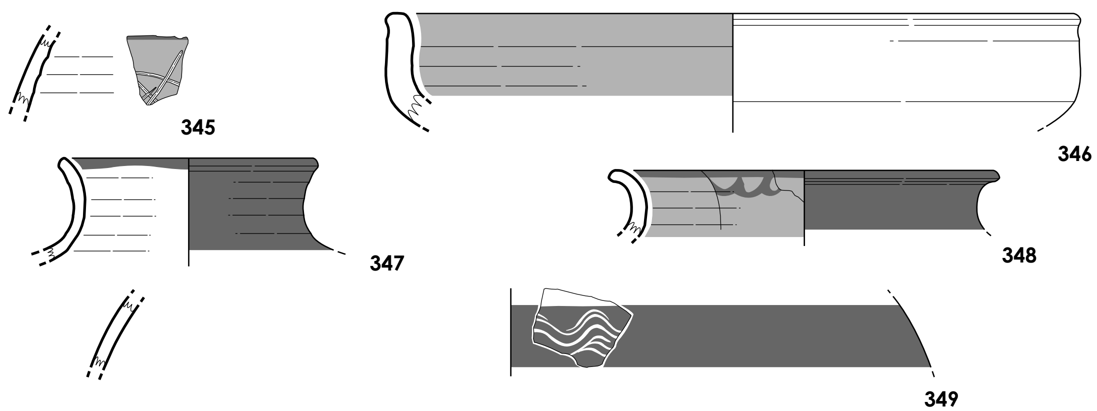


Figure 6.68 Pottery from Phase 5, Index Trench 1D5, Central Area (1:3)

Figure 6.69 Pottery from Phase 5, Central Area: Lane 1, western end (1:3)

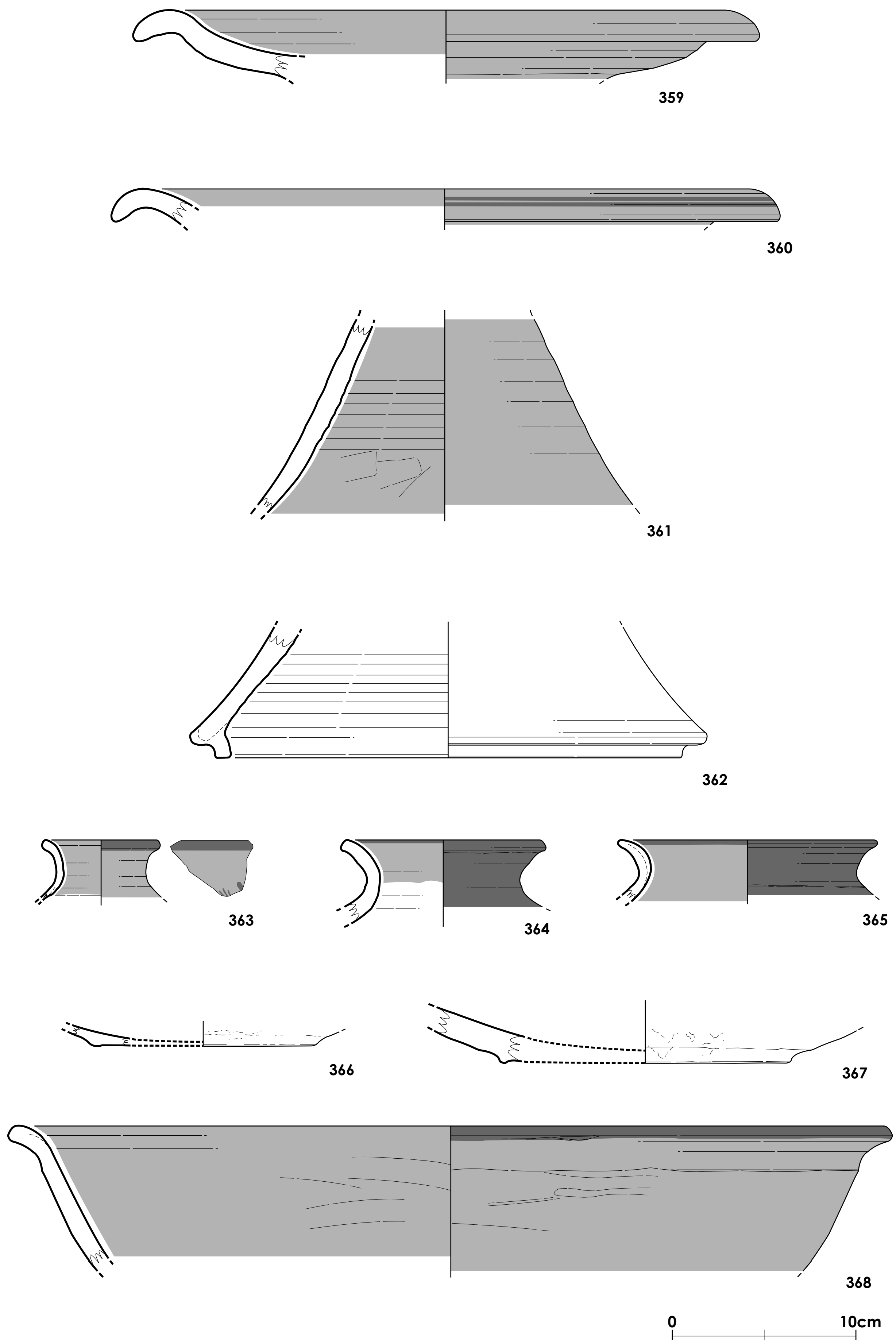


Figure 6.70 Pottery from Phase 5, Central Area: Lane 1, western end (1:3)

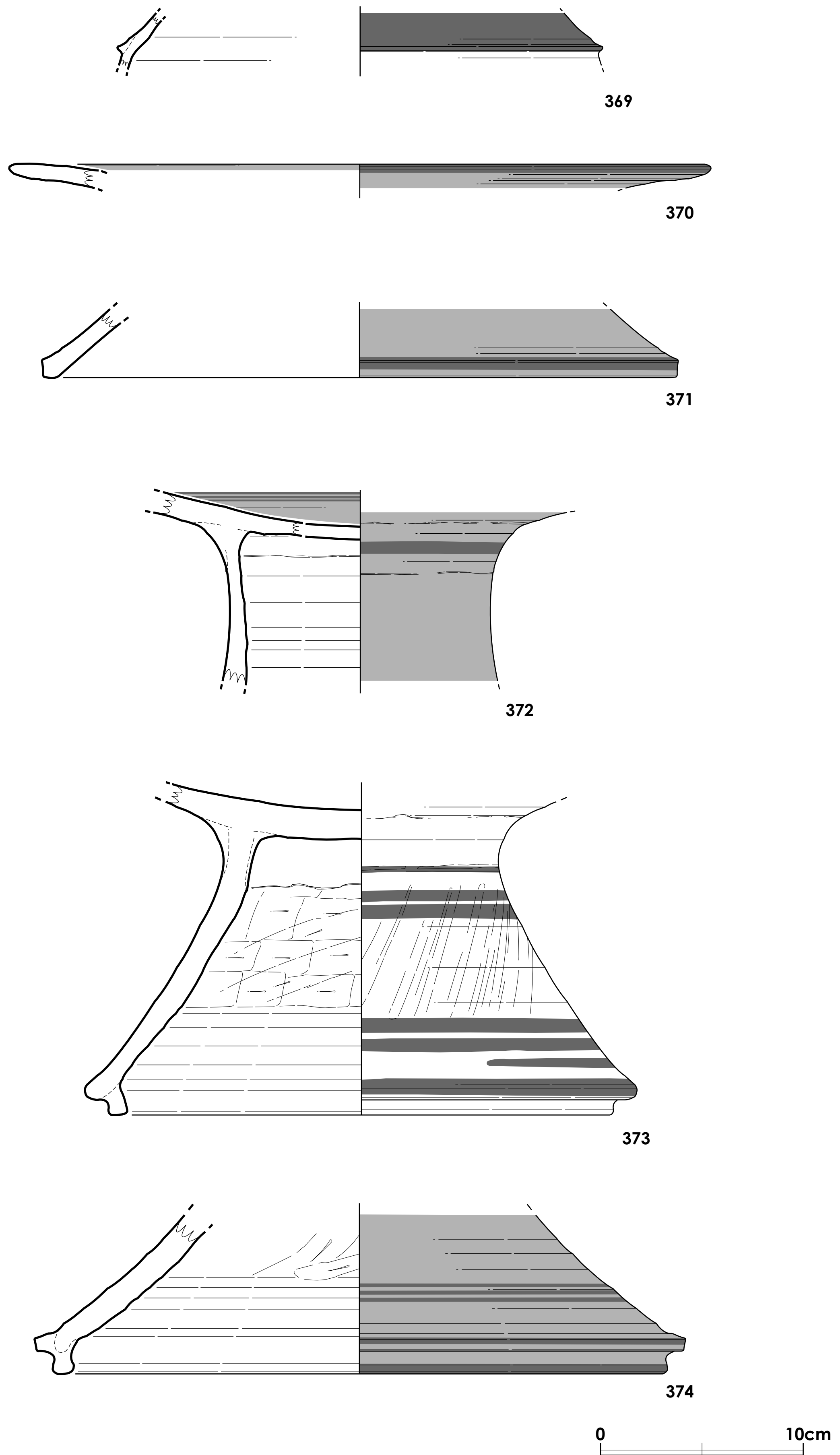


Figure 6.71 Pottery from Phase 5, Central Area: Lane 3 (1:3)

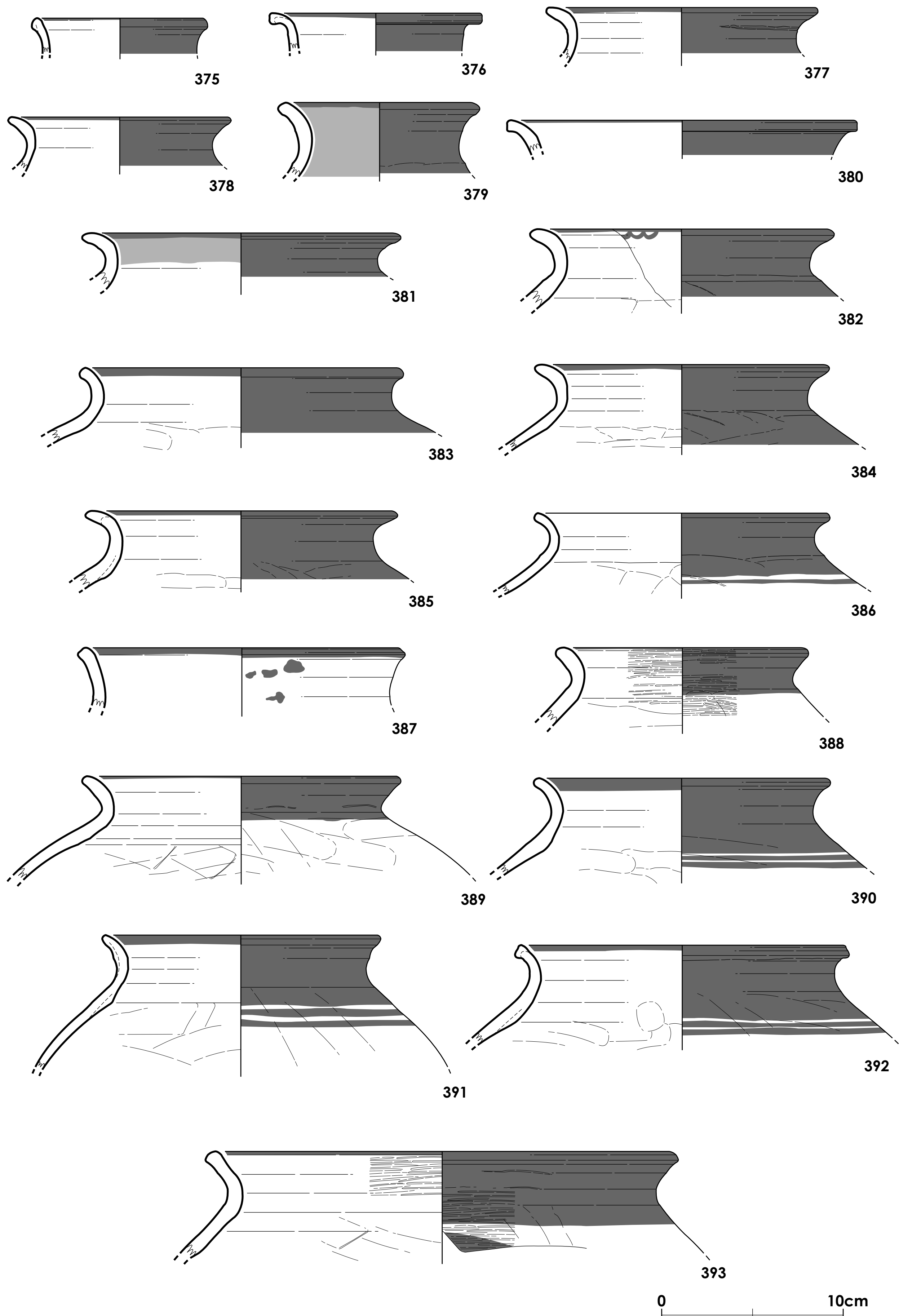


Figure 6.72 Pottery from Phase 5, Central Area: Lane 3 (1:3)

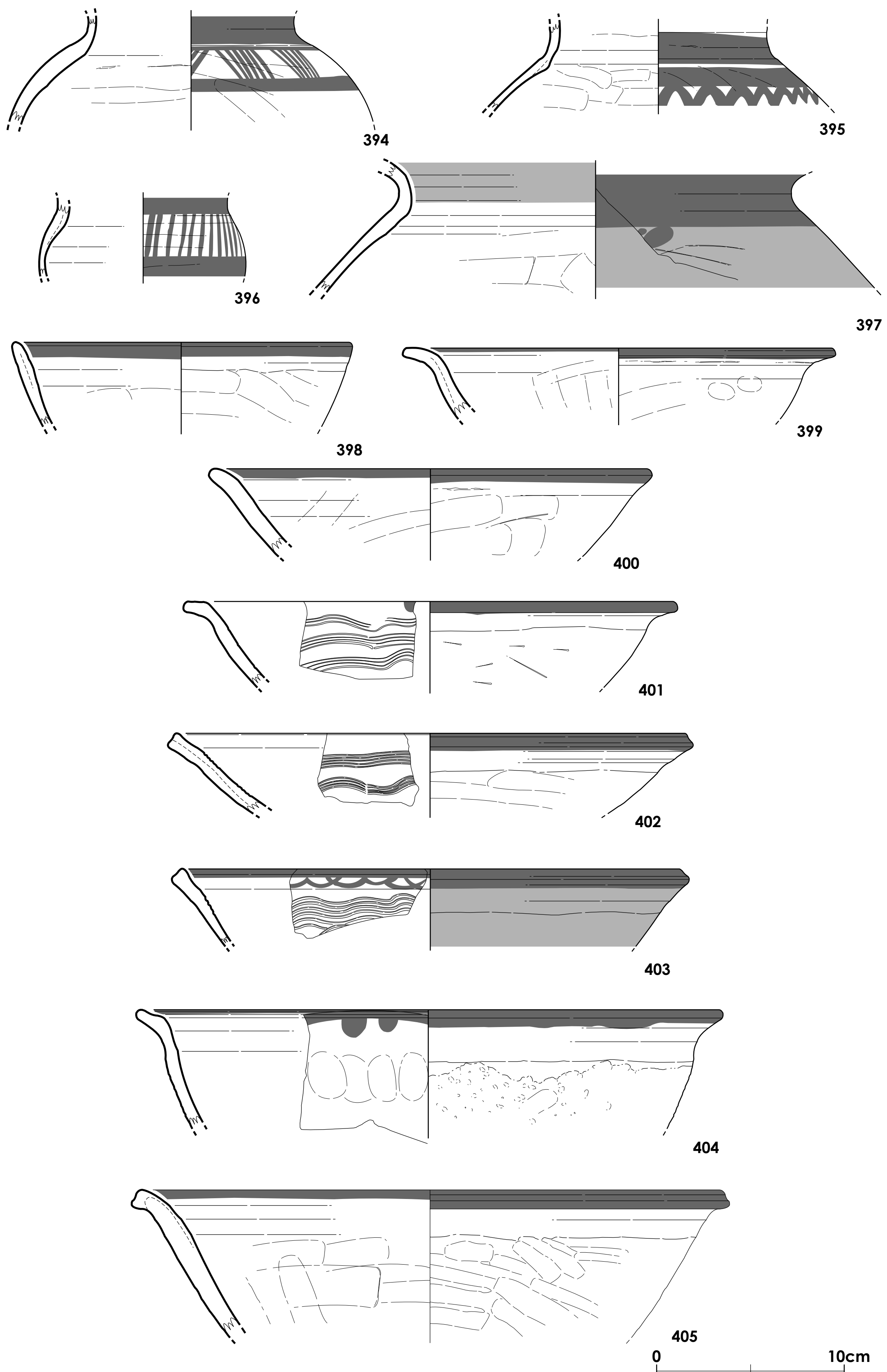


Figure 6.73 Pottery from Phase 5, Central Area: Lane 3 (1:3)

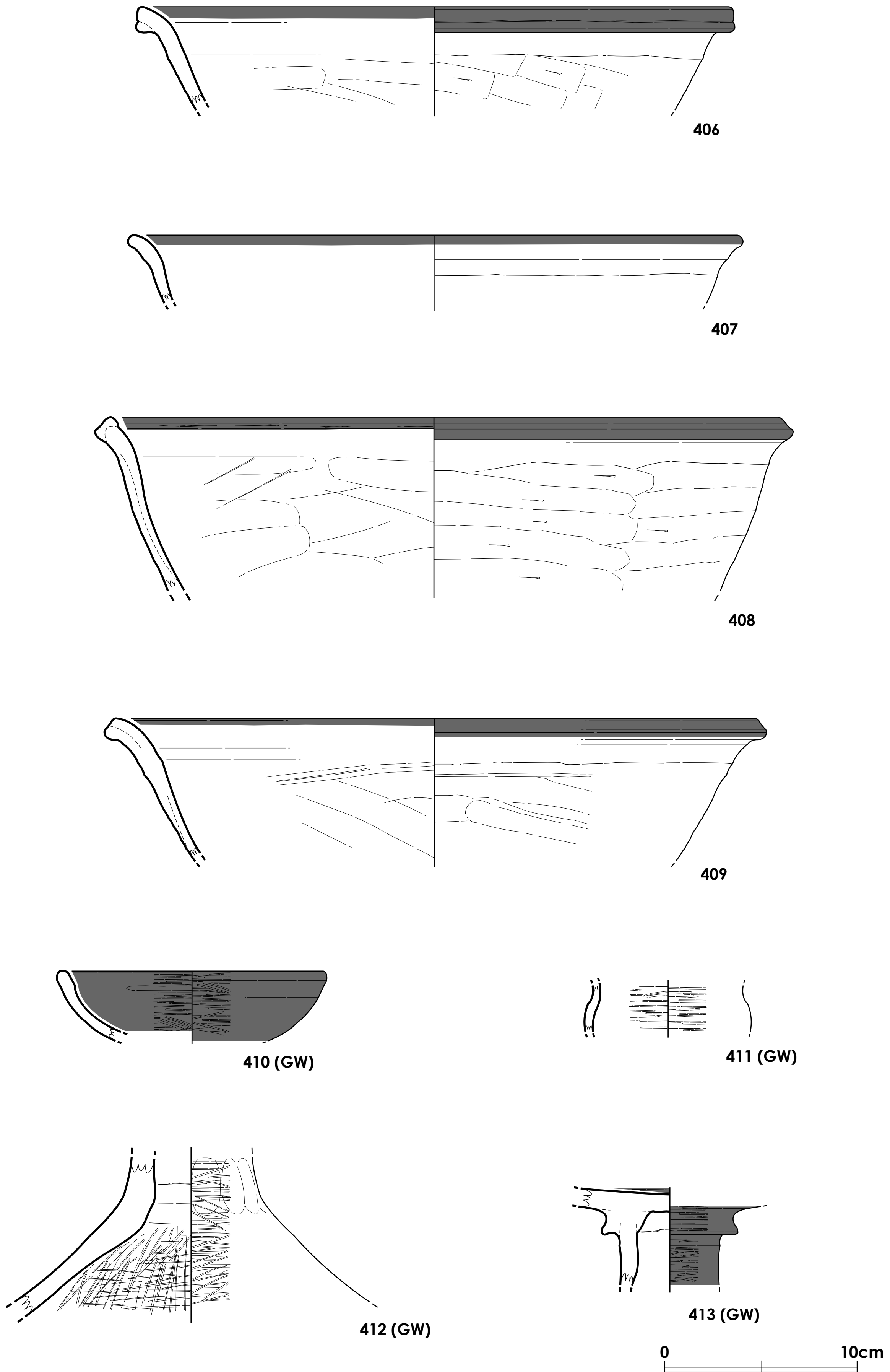


Figure 6.74 Pottery from Phase 5, Central Area: Lane 3 (1:3)

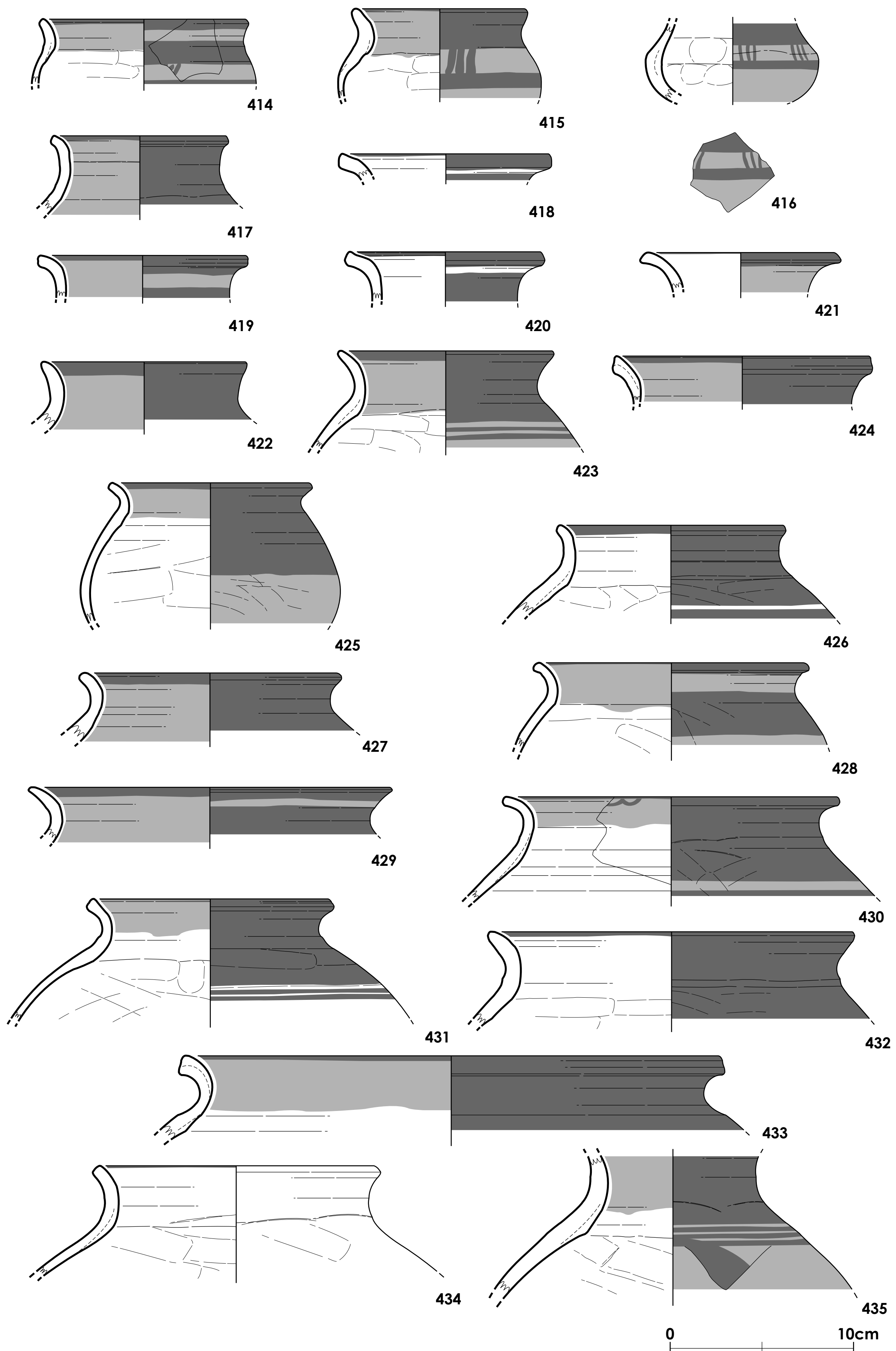


Figure 6.75 Pottery from Phase 5, Central Area: 1F809010 (1:3)

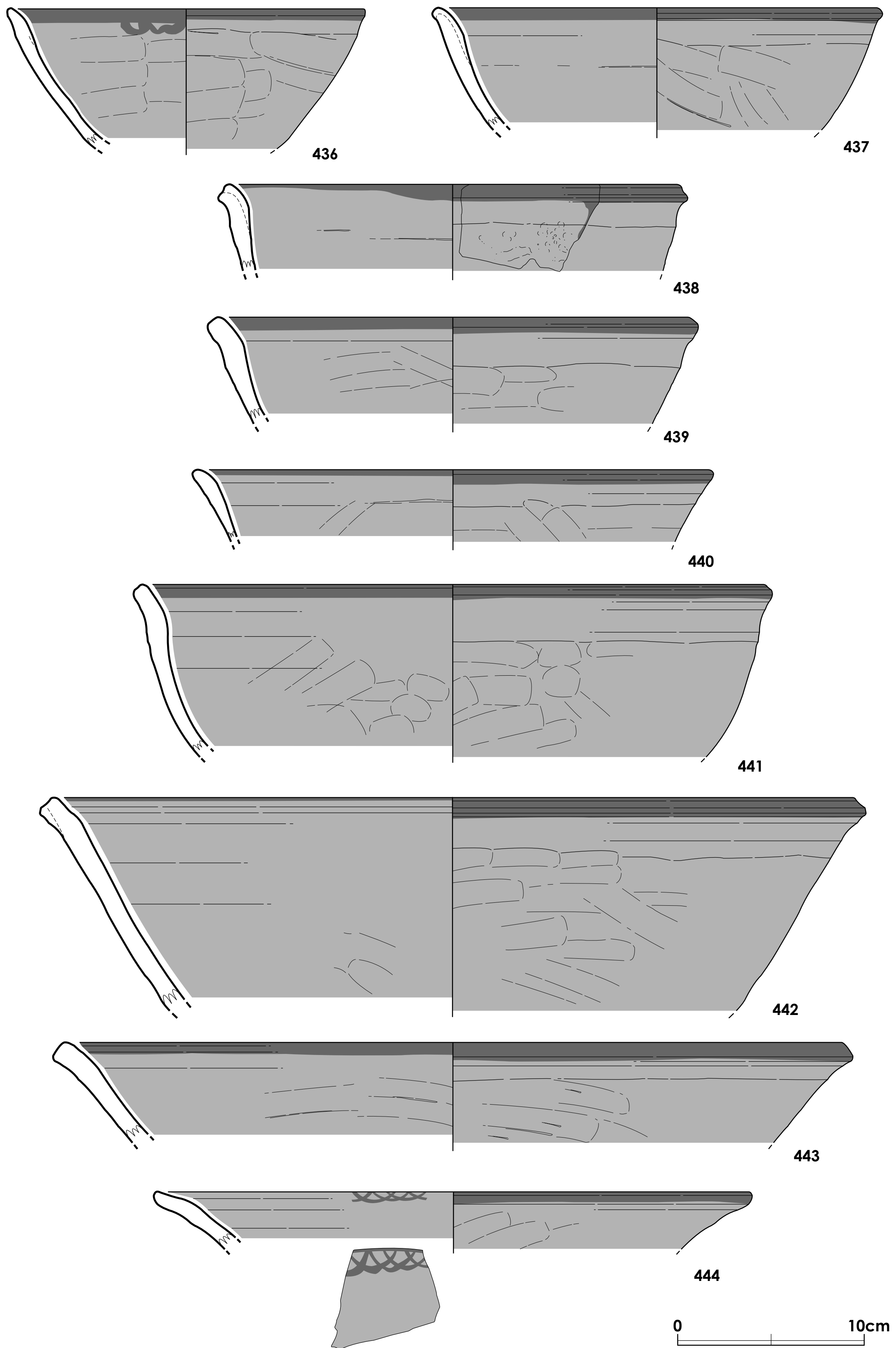


Figure 6.76 Pottery from Phase 5, Central Area: 1F809010 (1:3)

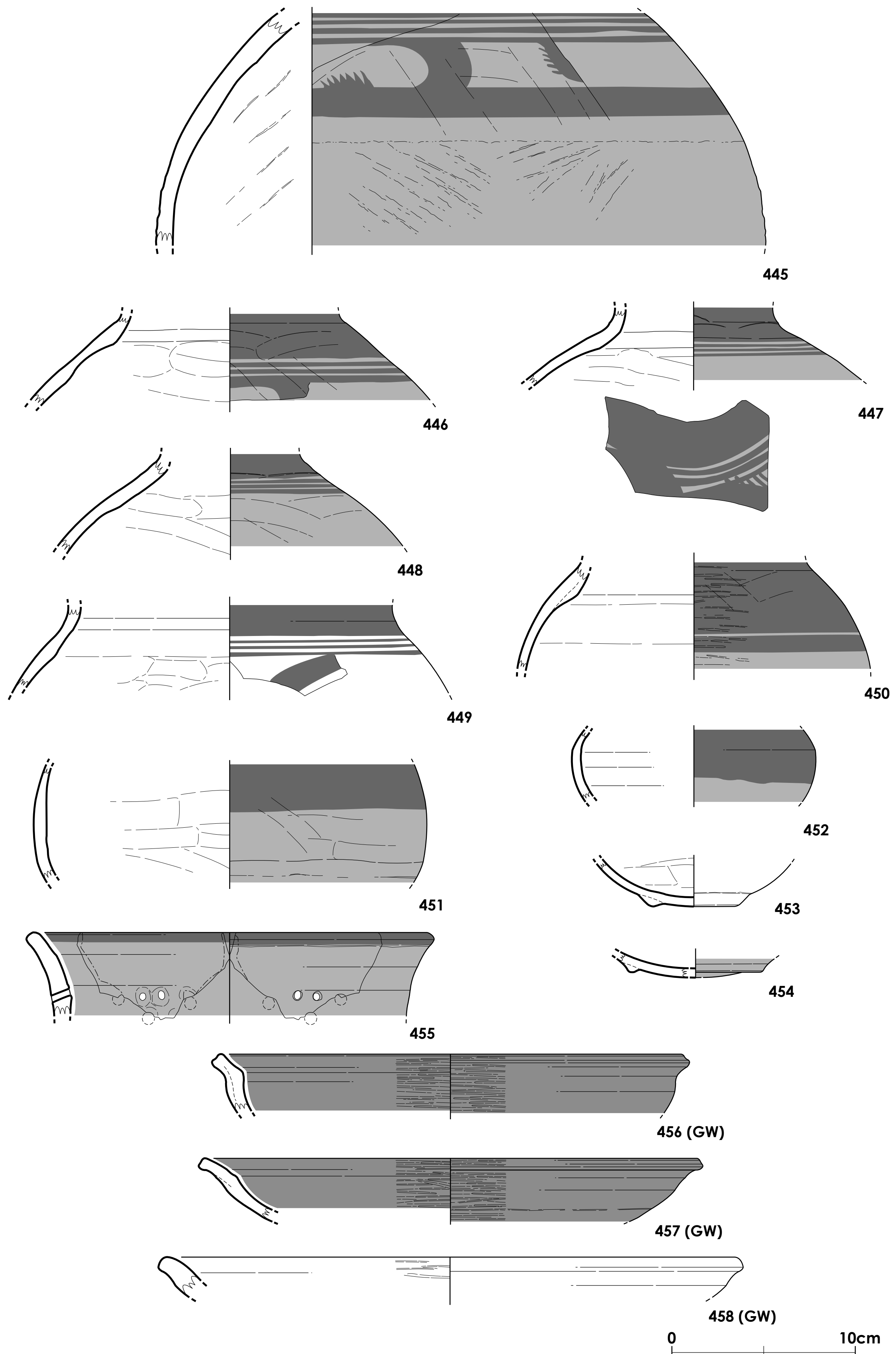


Figure 6.77 Pottery from Phase 5, Central Area: 1F809010 (1:3)

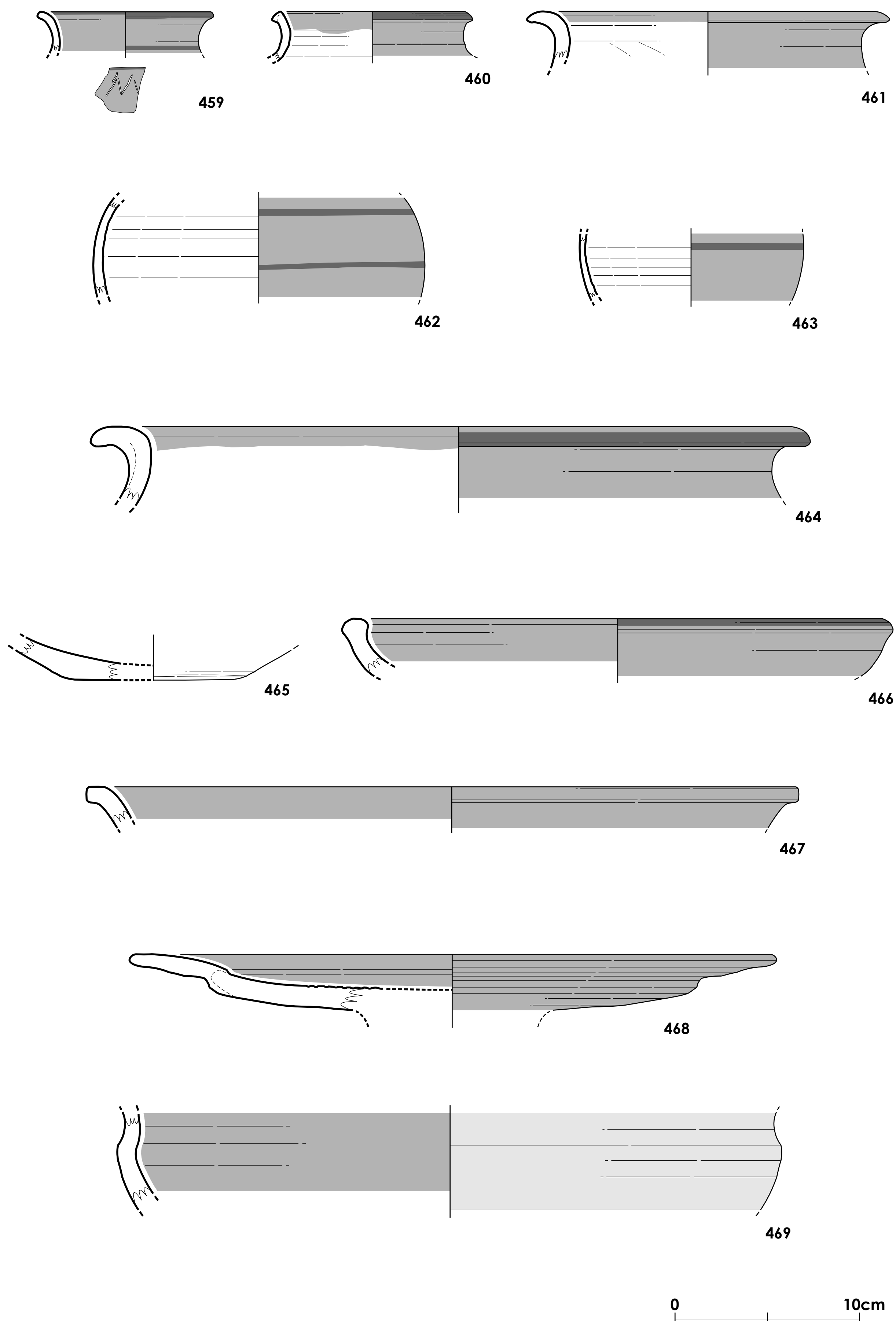


Figure 6.78 Pottery from Phase 5, Central Area: 1F809010 (1:3)

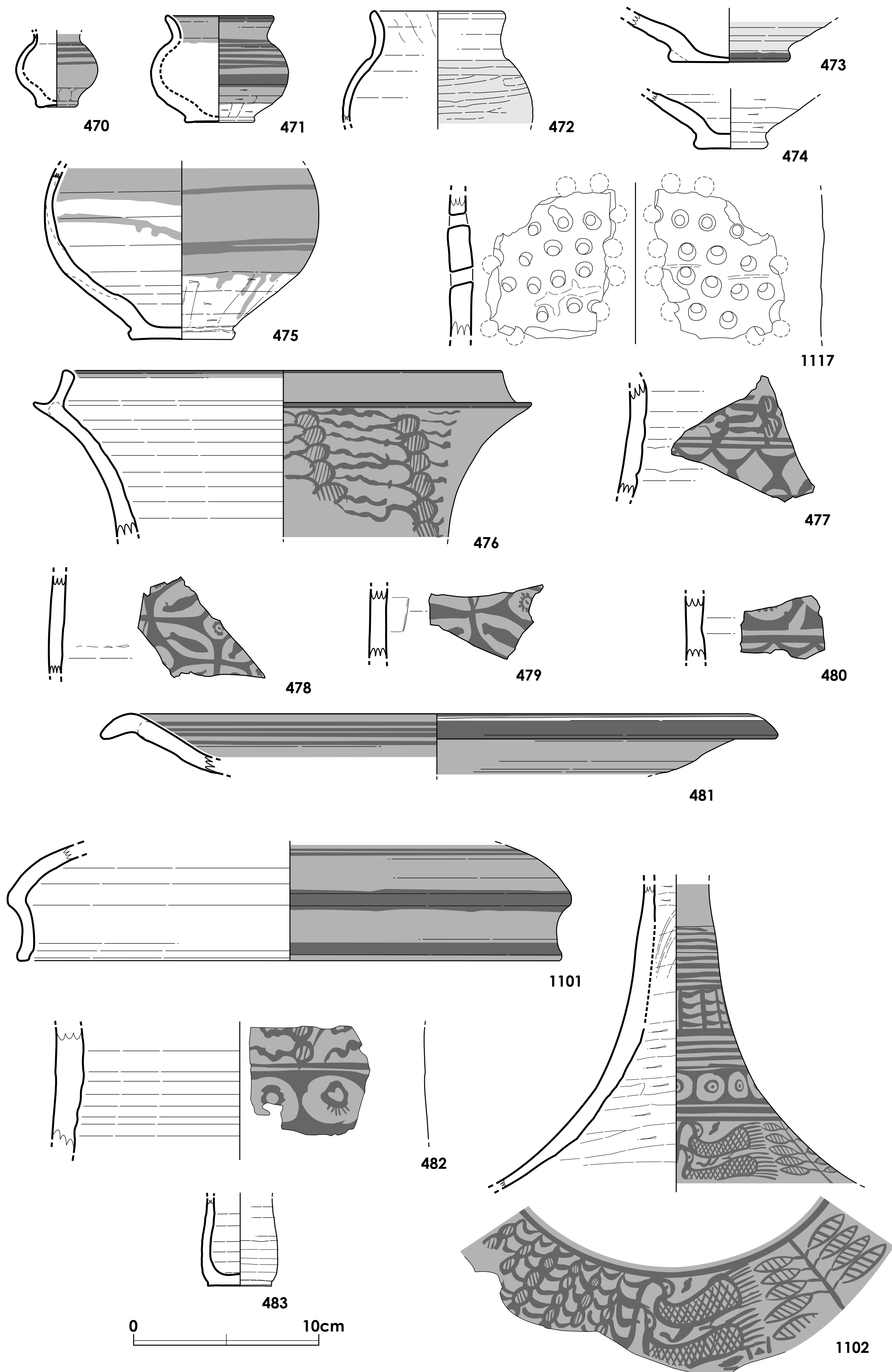


Figure 6.79 Pottery from Phase 5, Central Area (1:3)

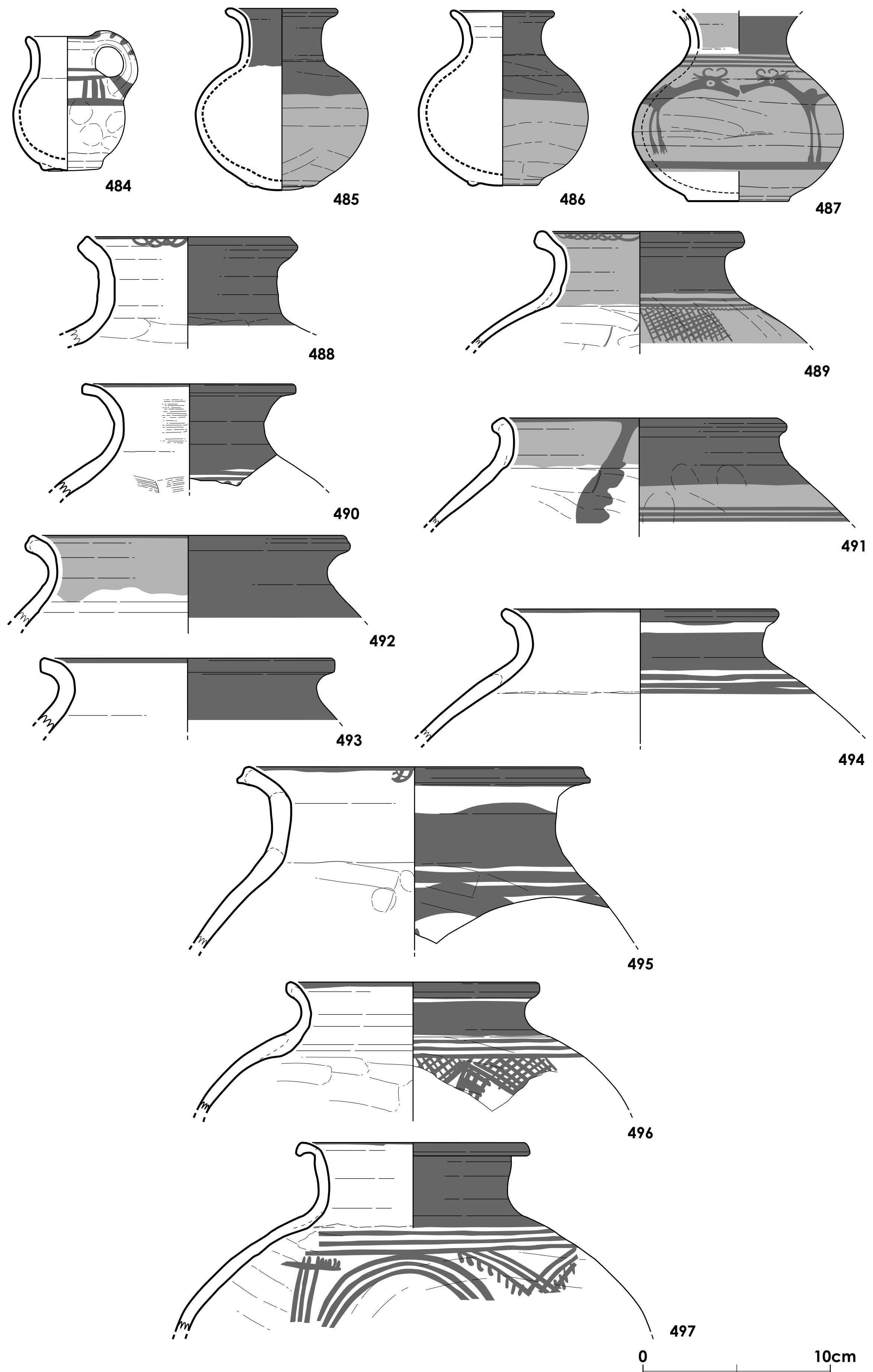


Figure 6.80 Pottery from Phase 5, Central Area (1:3)

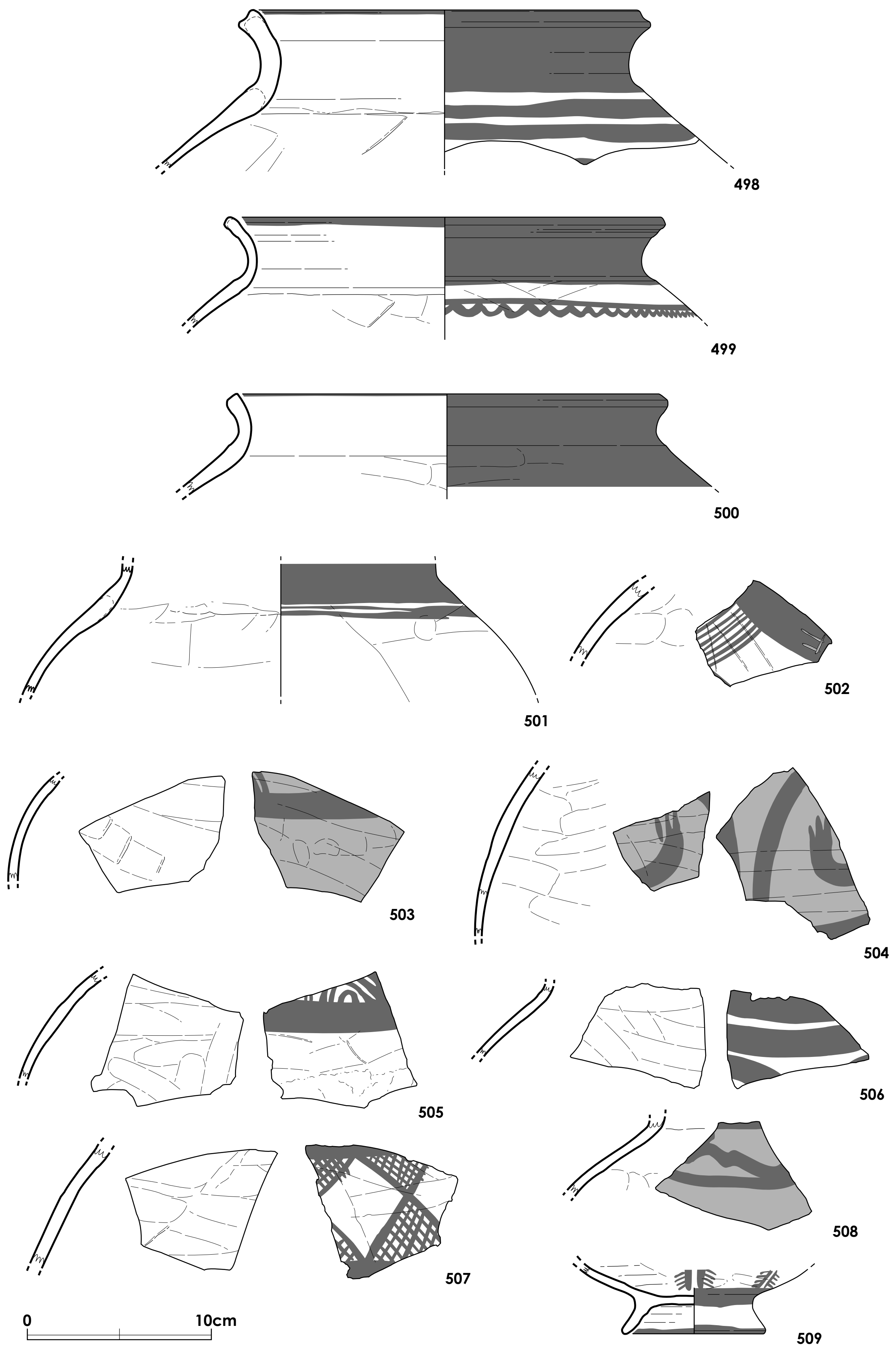


Figure 6.81 Pottery from Phase 5, Central Area (1:3)

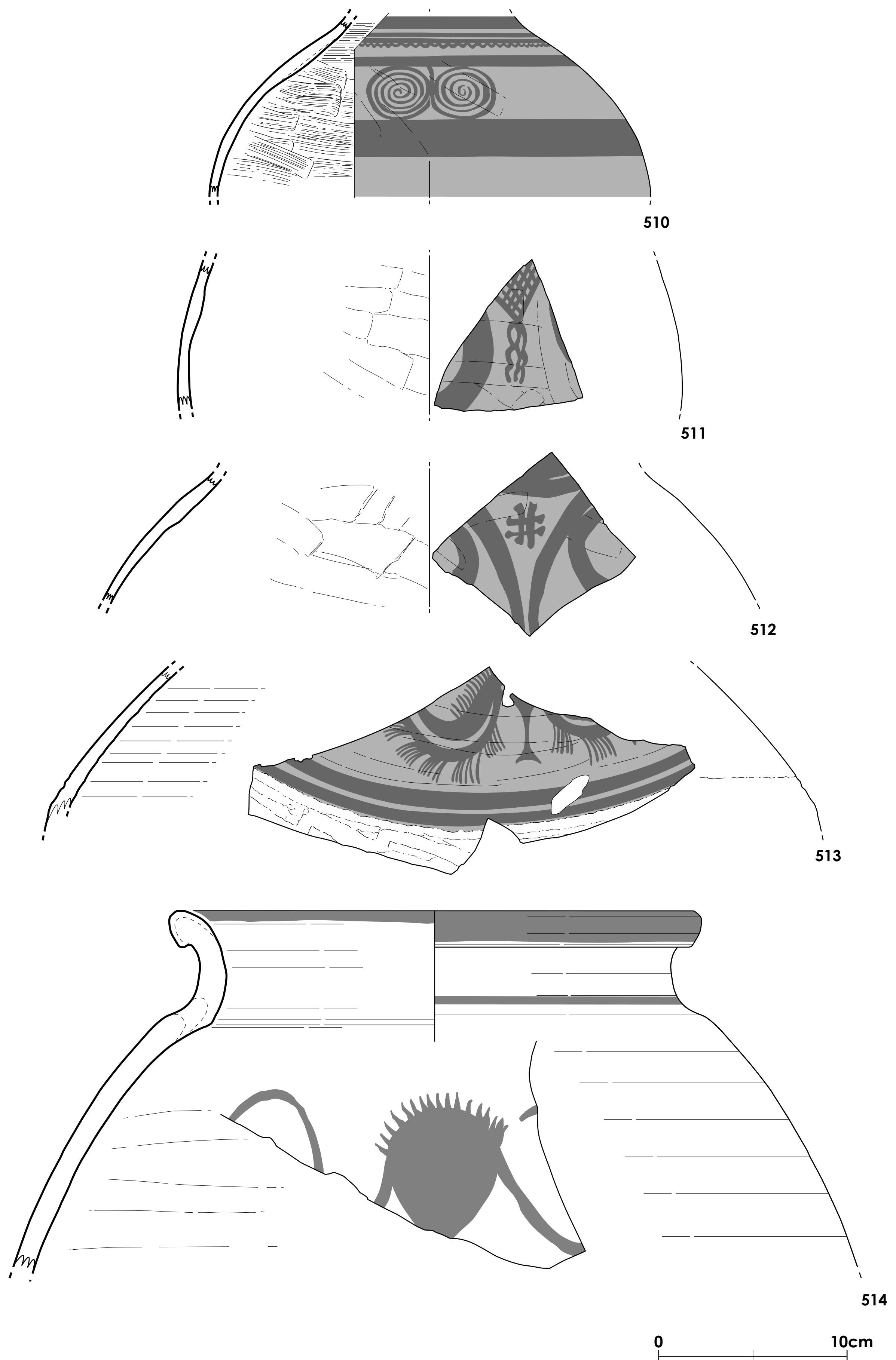


Figure 6.82 Pottery from Phase 5, Central Area (1:3)

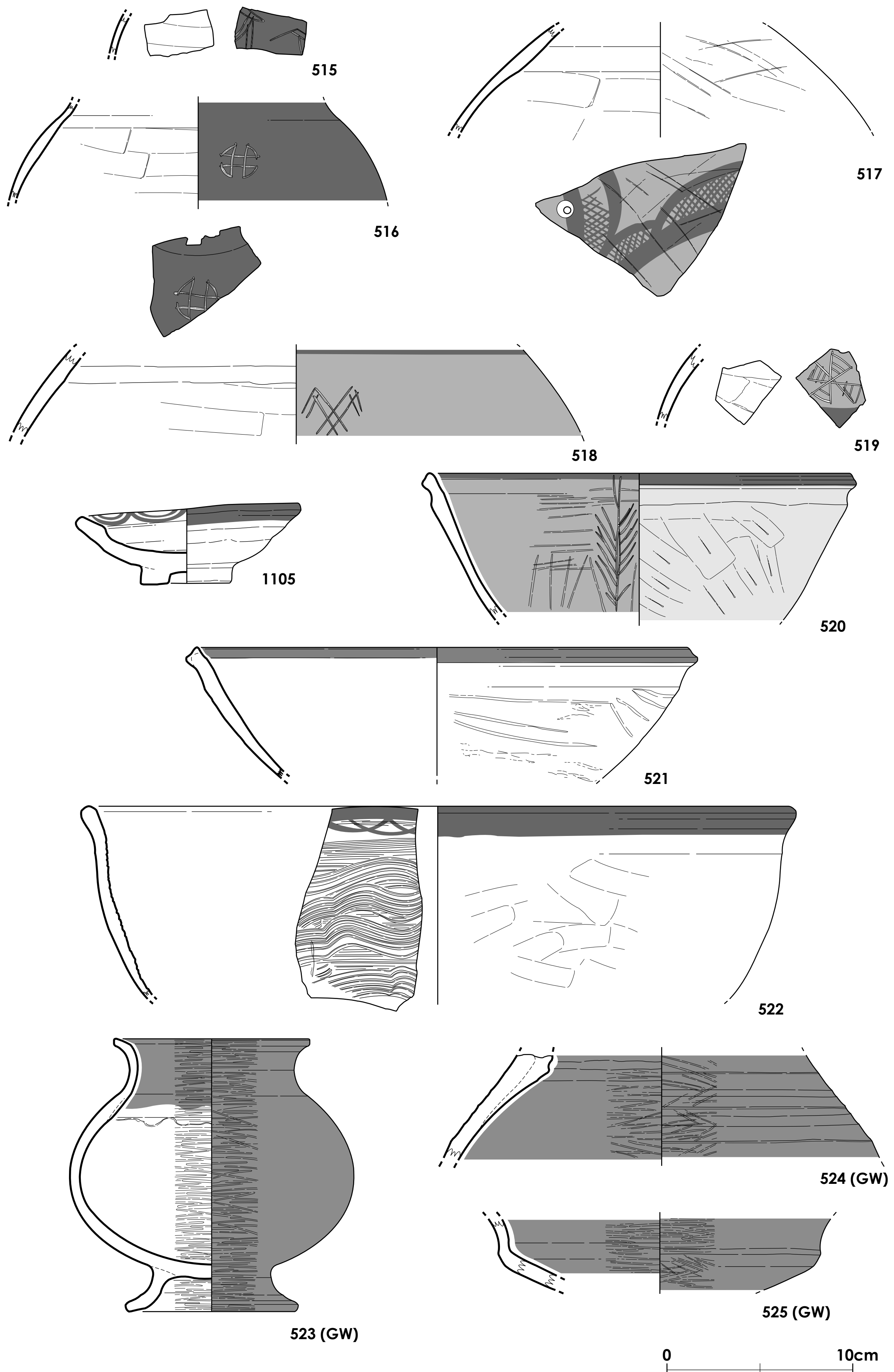


Figure 6.83 Pottery from Phase 5, Central Area (1:3)

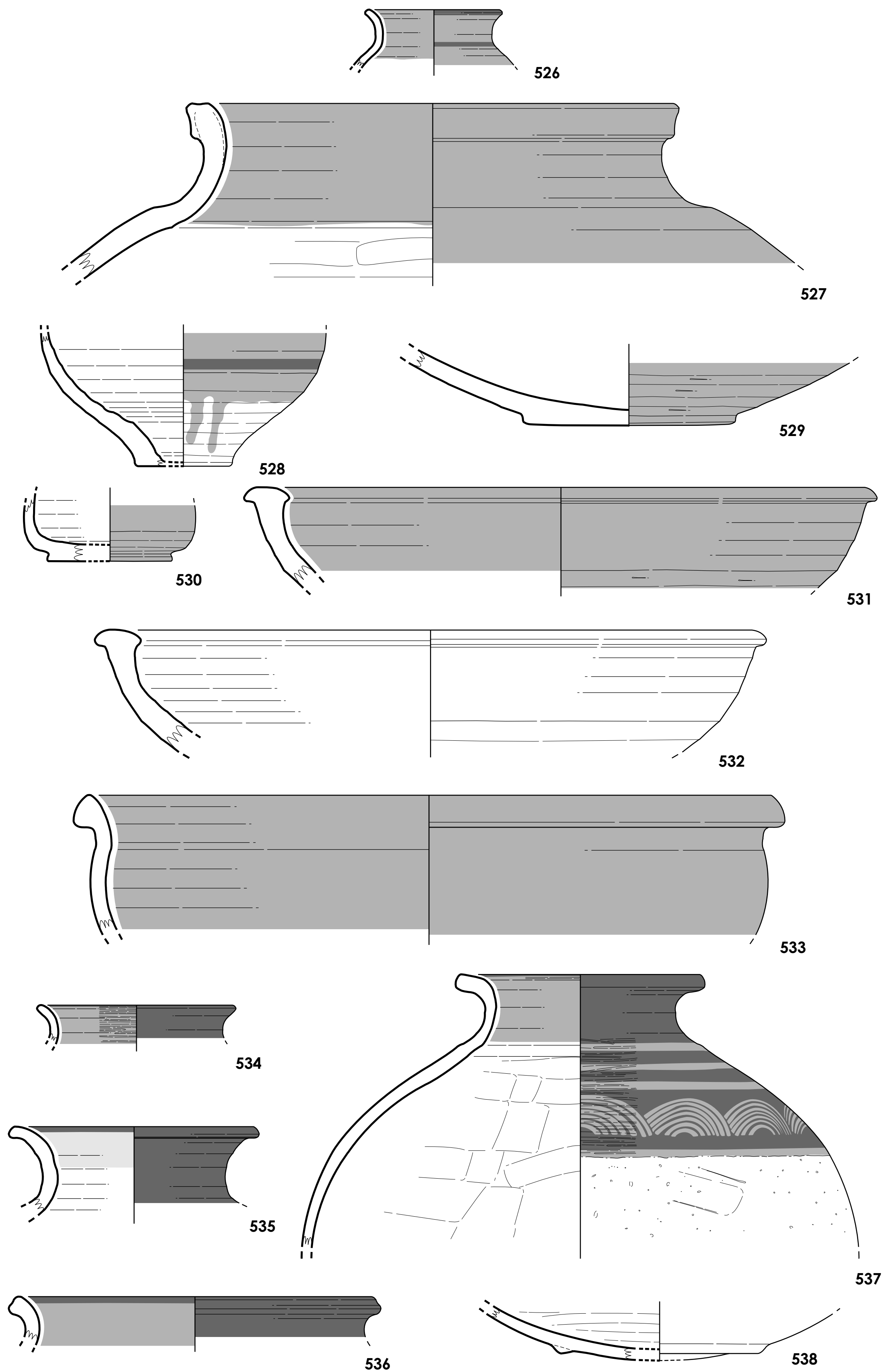


Figure 6.84 Pottery from Phase 5, Trench 1D9, Central Area (1:3)

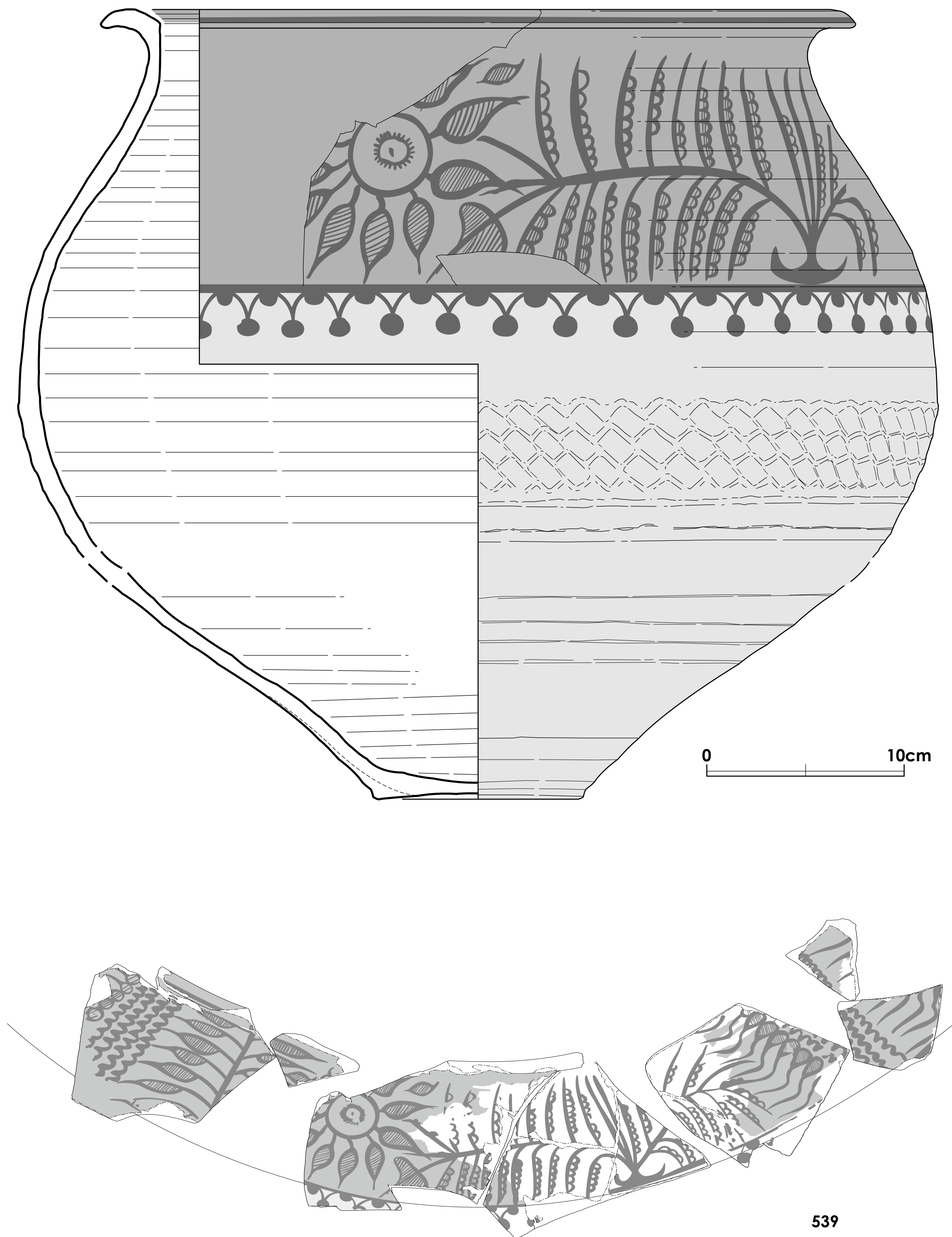


Figure 6.85 Pottery from Phase 4, East Area (1:3)

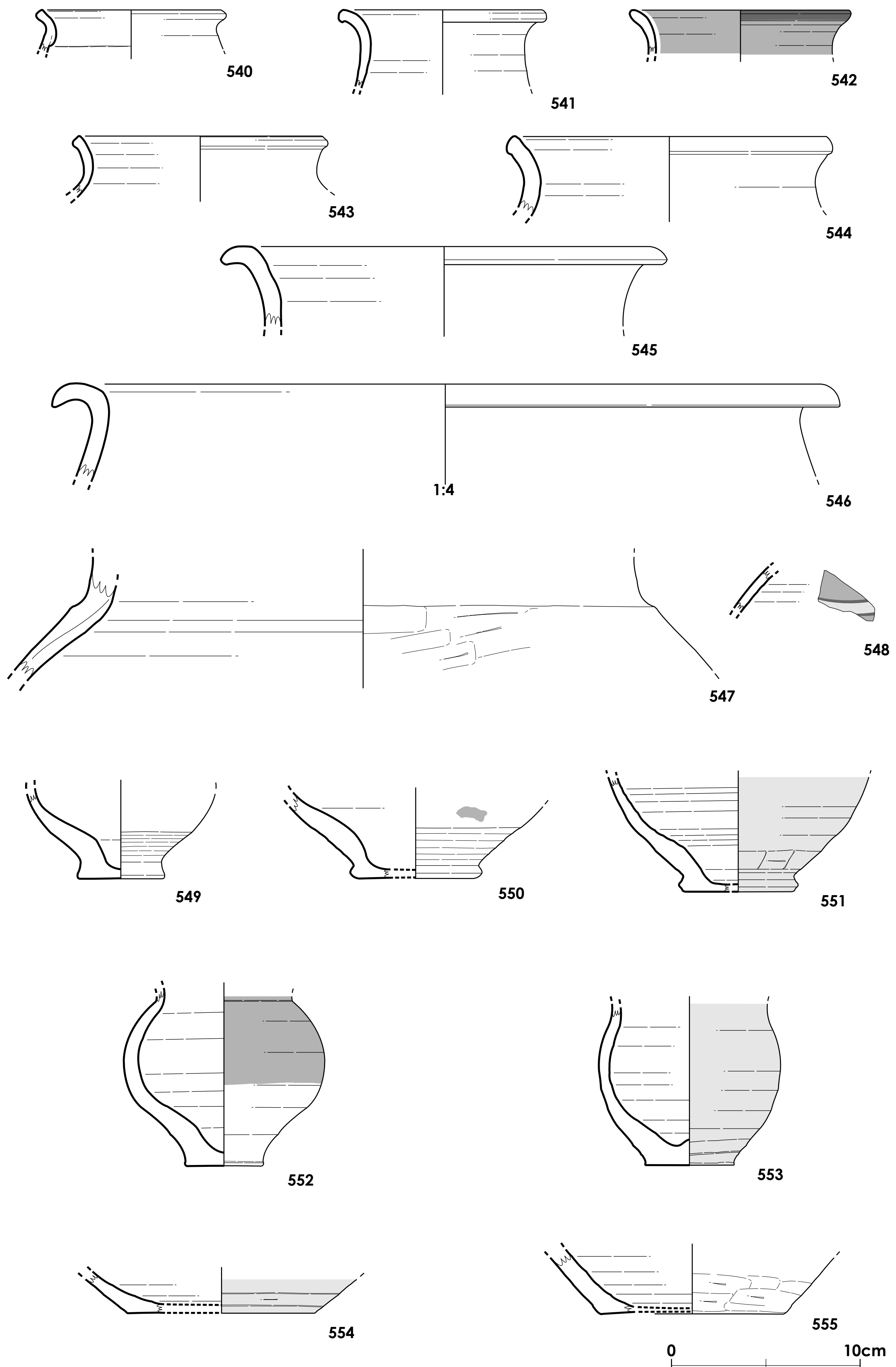


Figure 6.86 Pottery from Phase 4, Trench 2XD4, East Area (1:3)

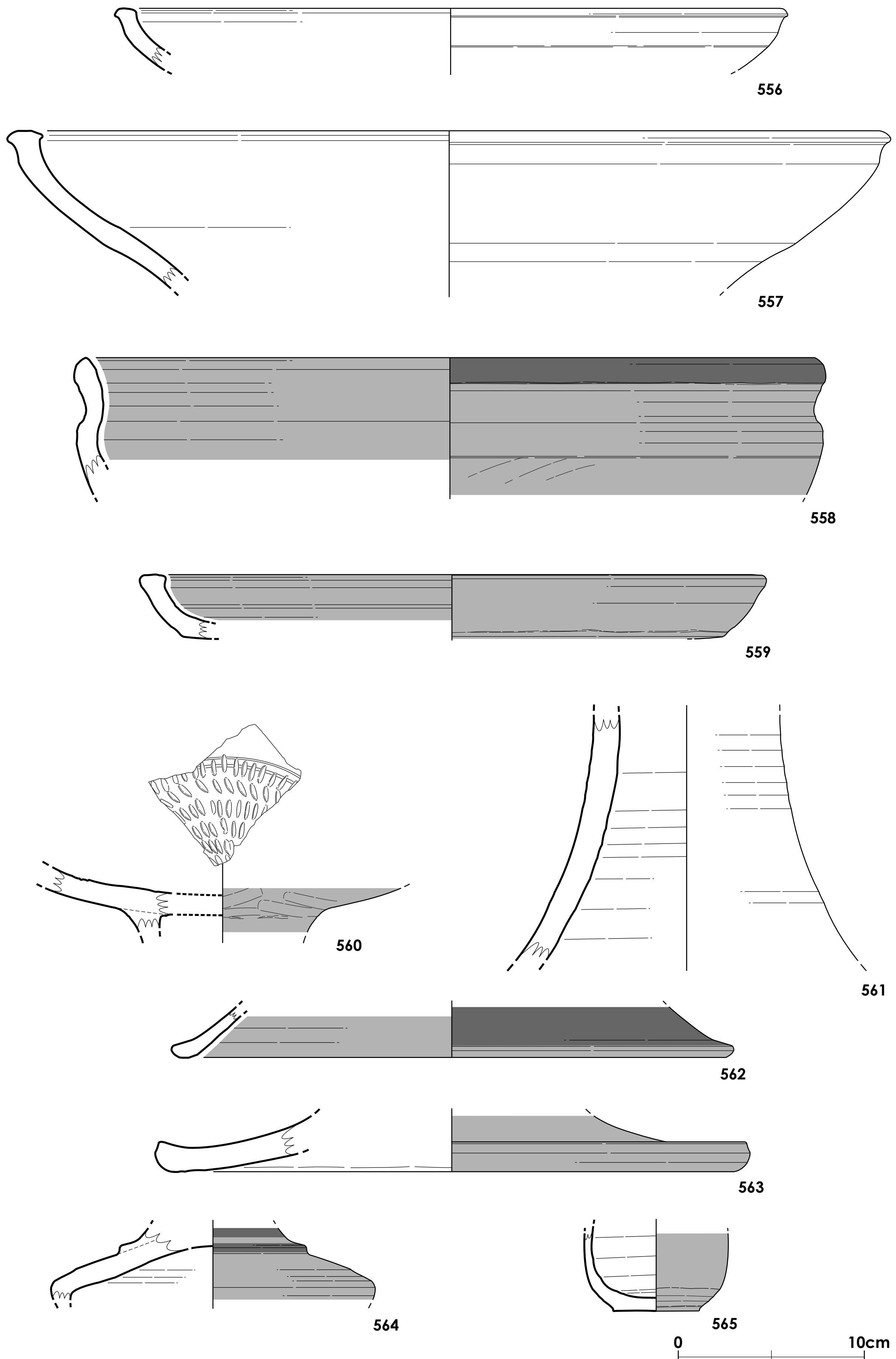


Figure 6.87 Pottery from Phase 4, Trench 2XD4, East Area (1:3)

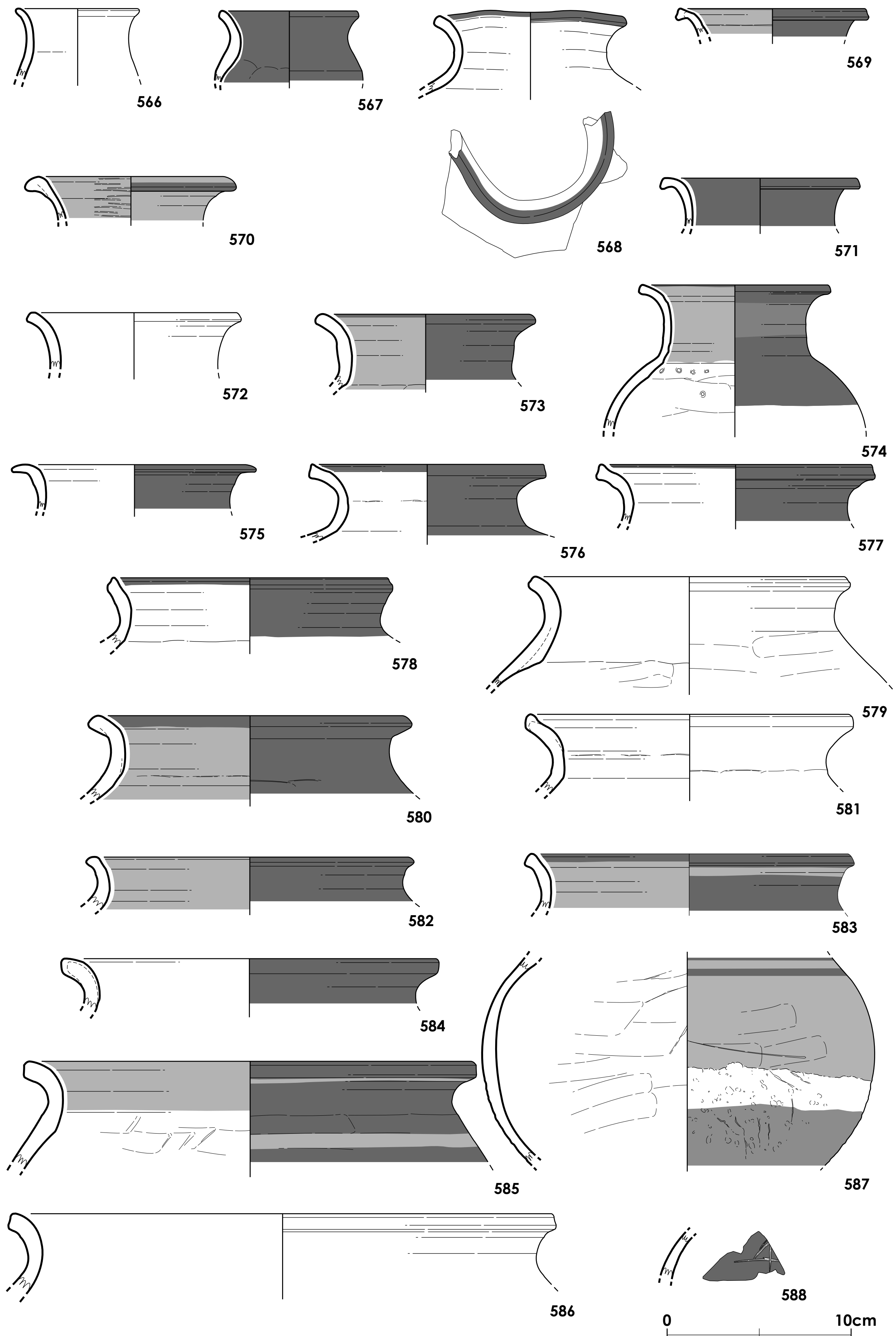


Figure 6.88 Pottery from Phase 4, Trench 2XD4, East Area (1:3)

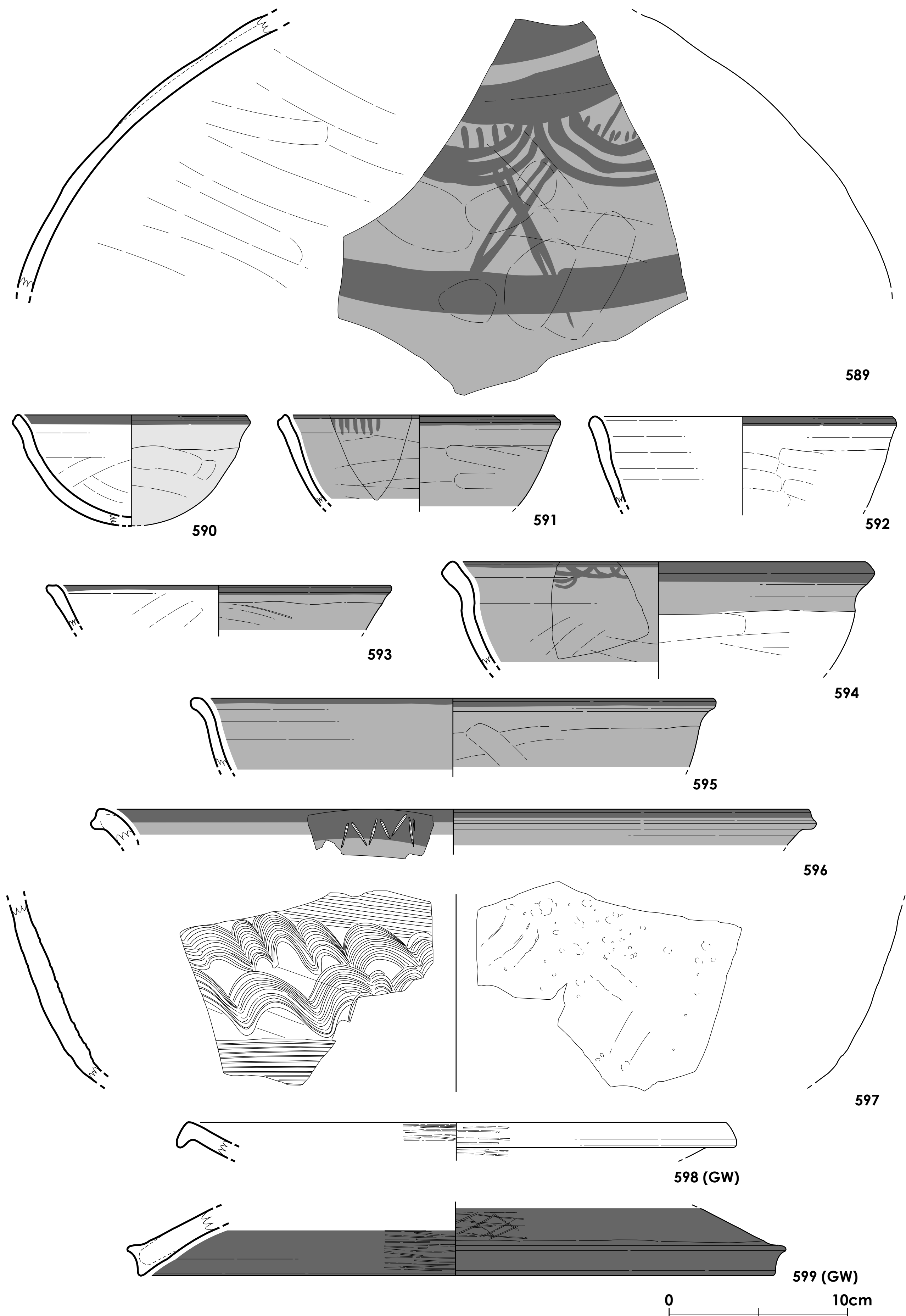


Figure 6.89 Pottery from Phase 4, Trench 2XD4, East Area (1:3)

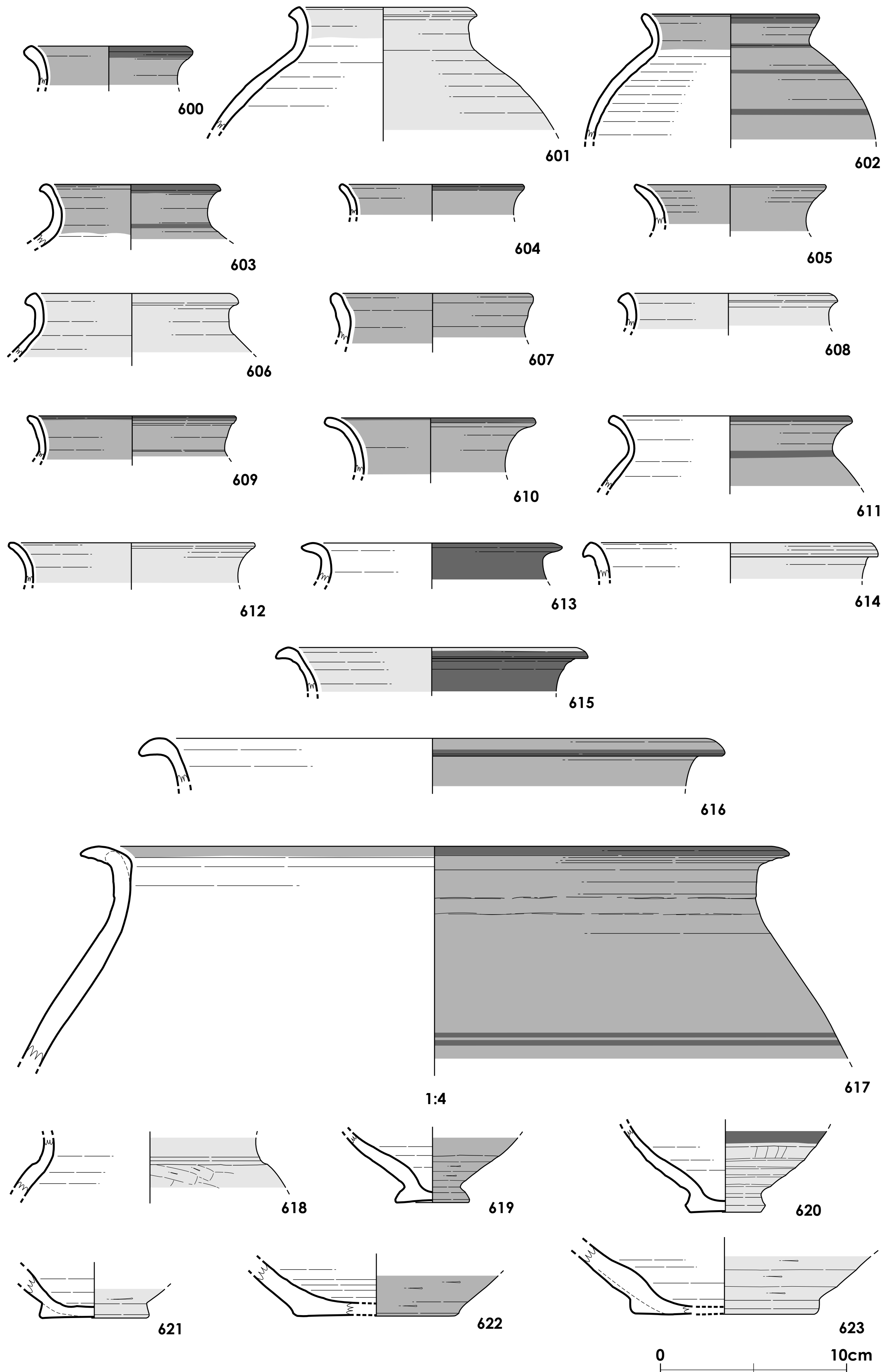


Figure 6.90 Pottery from Phase 2, Trench 3U17, Northwest Area (1:3)

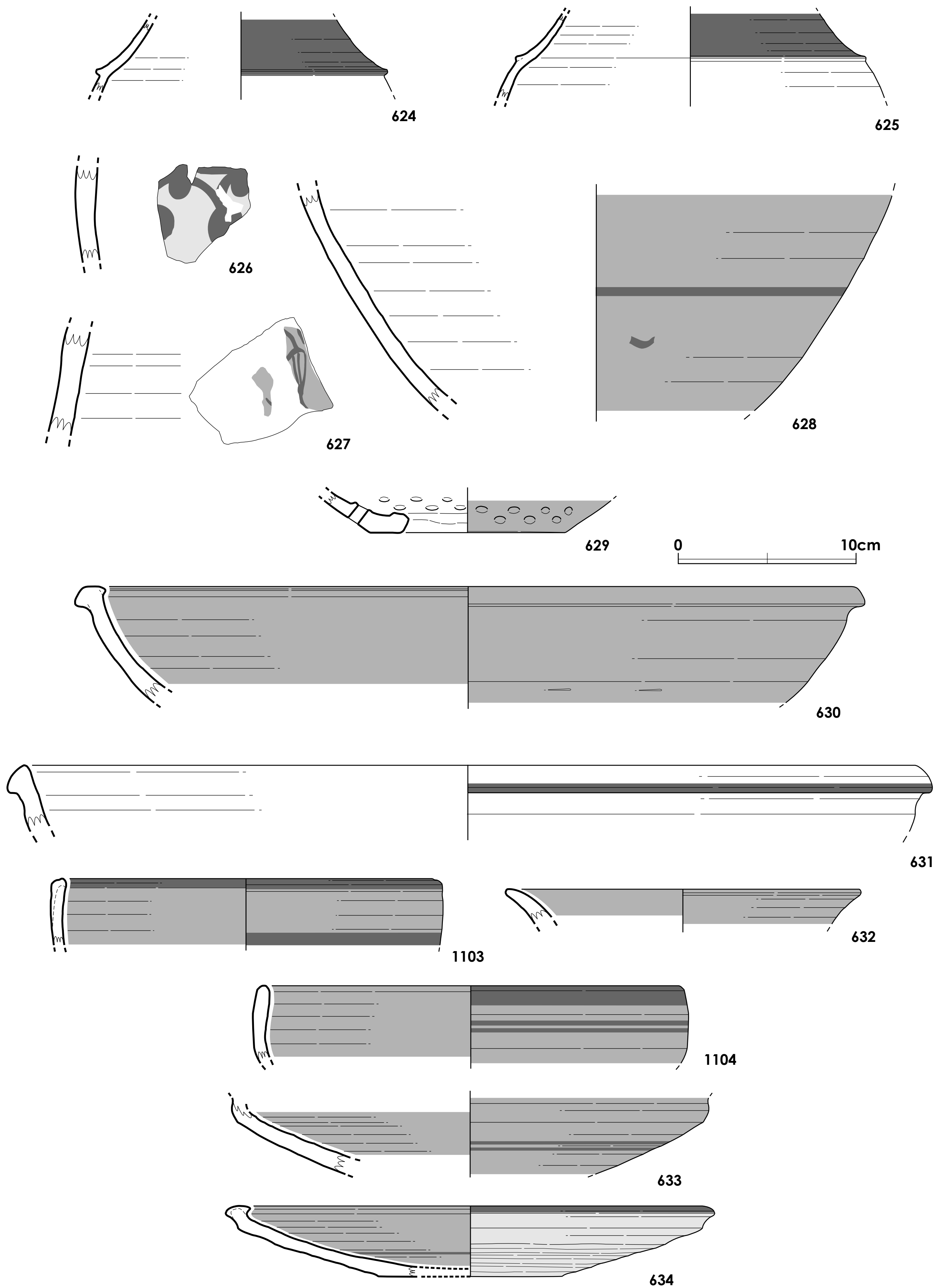


Figure 6.91 Pottery from Phase 2, Trench 3U17, Northwest Area (1:3)

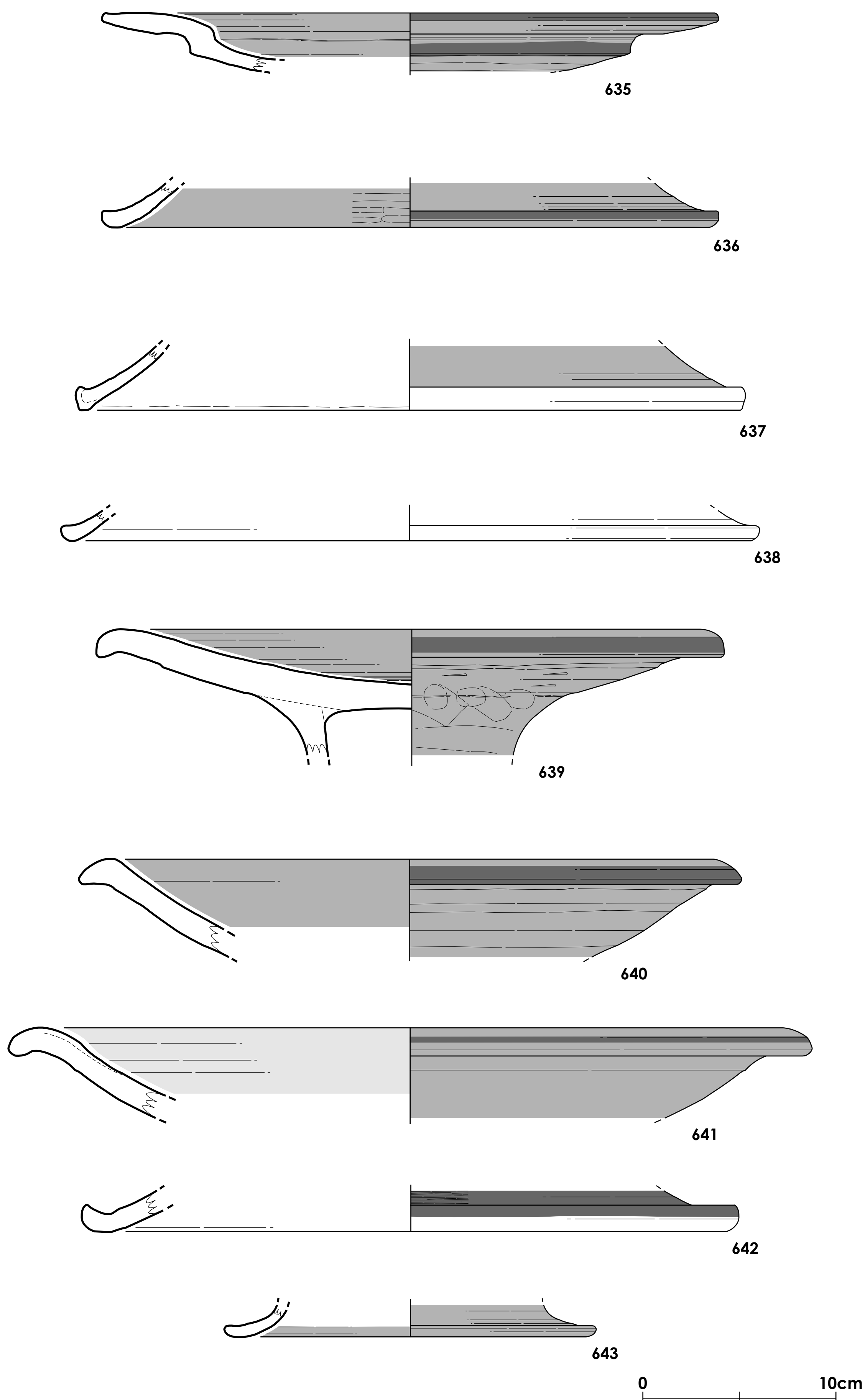


Figure 6.92 Pottery from Phase 2, Trench 3U17, Northwest Area (1:3)

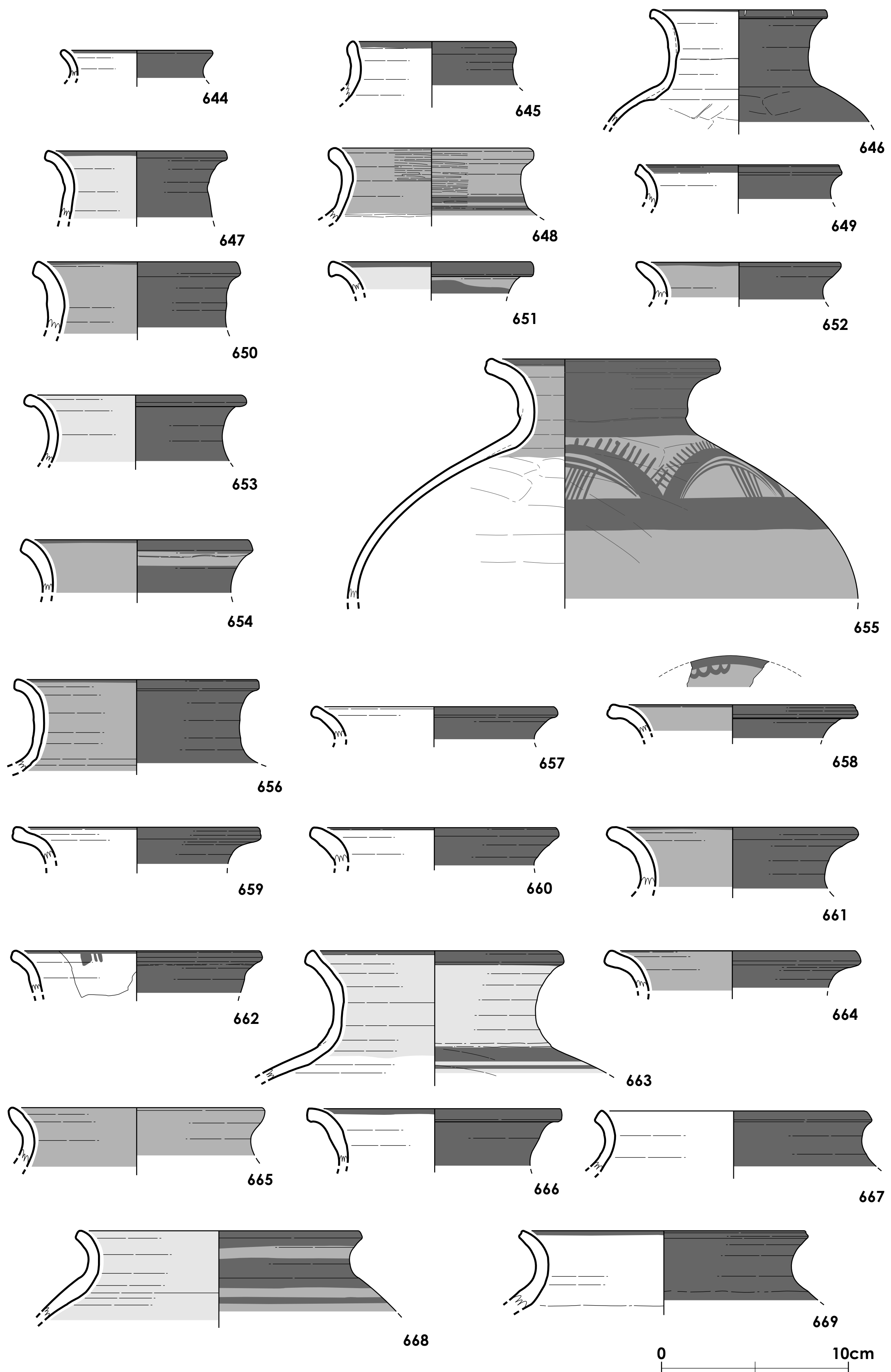


Figure 6.93 Pottery from Phase 2, Trench 3U17, Northwest Area (1:3)

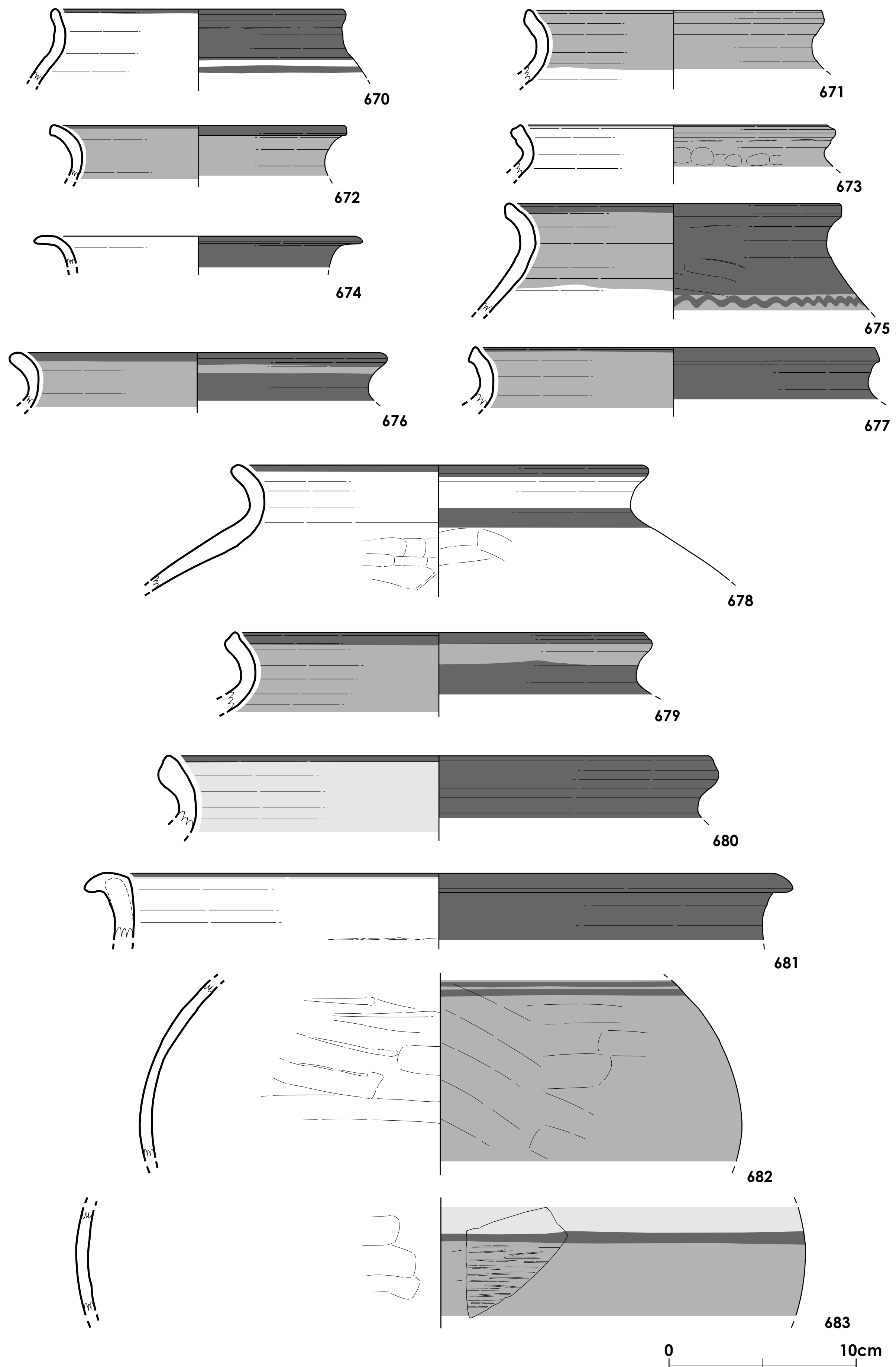


Figure 6.94 Pottery from Phase 2, Trench 3U17, Northwest Area (1:3)

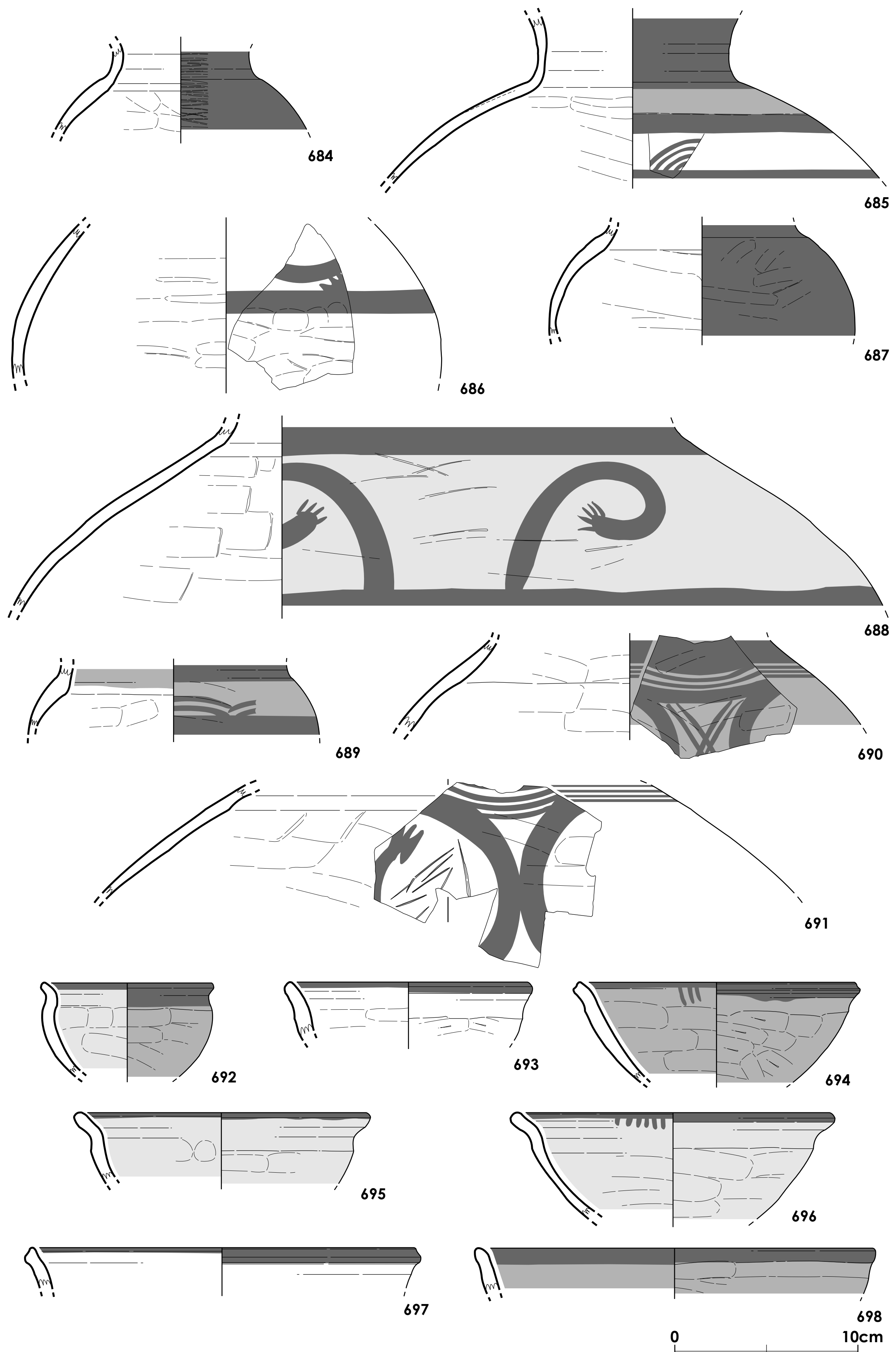


Figure 6.95 Pottery from Phase 2, Trench 3U17, Northwest Area (1:3)

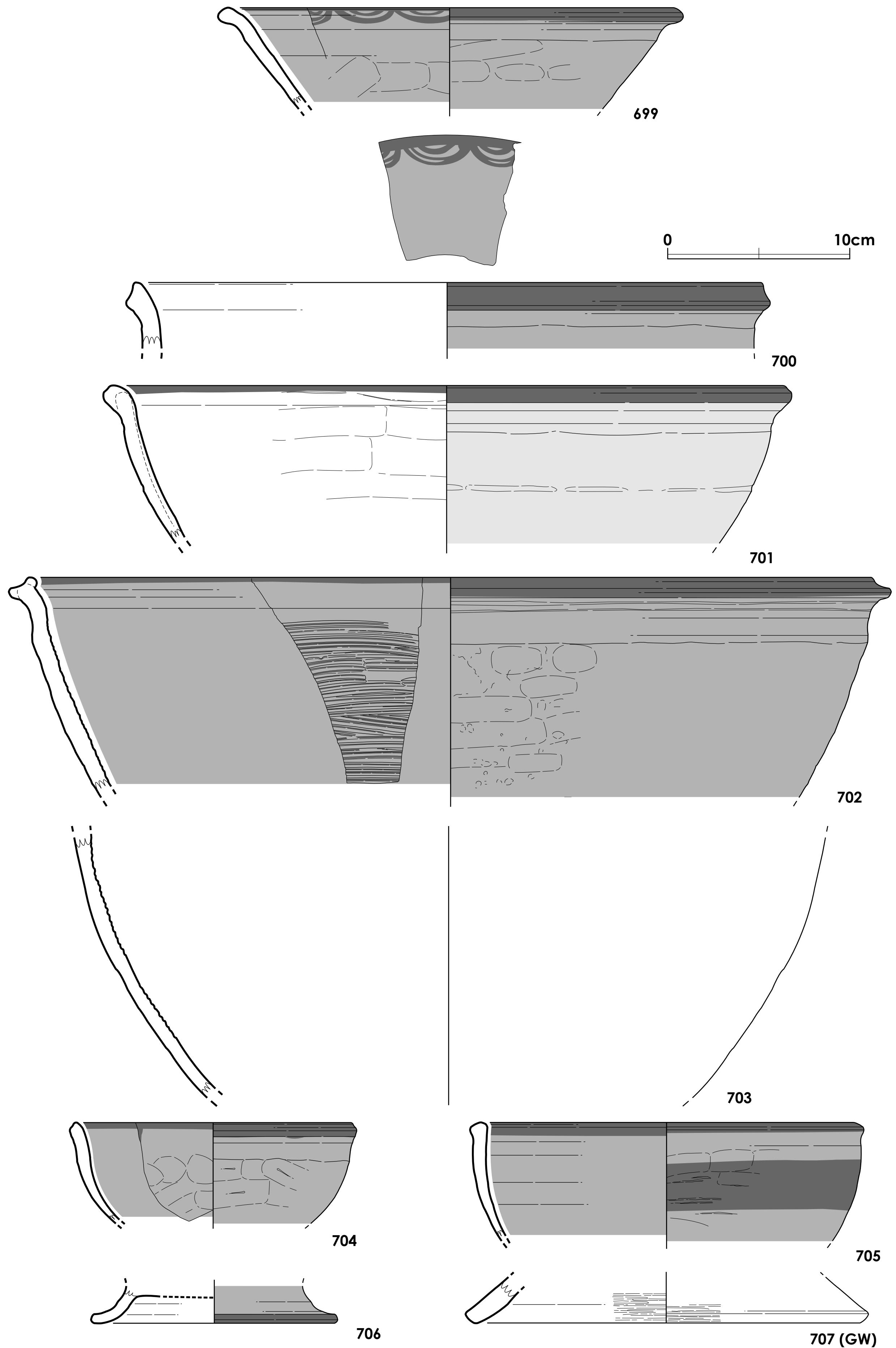


Figure 6.96 Pottery from Phase 2, Trench 3U17, Northwest Area (1:3)

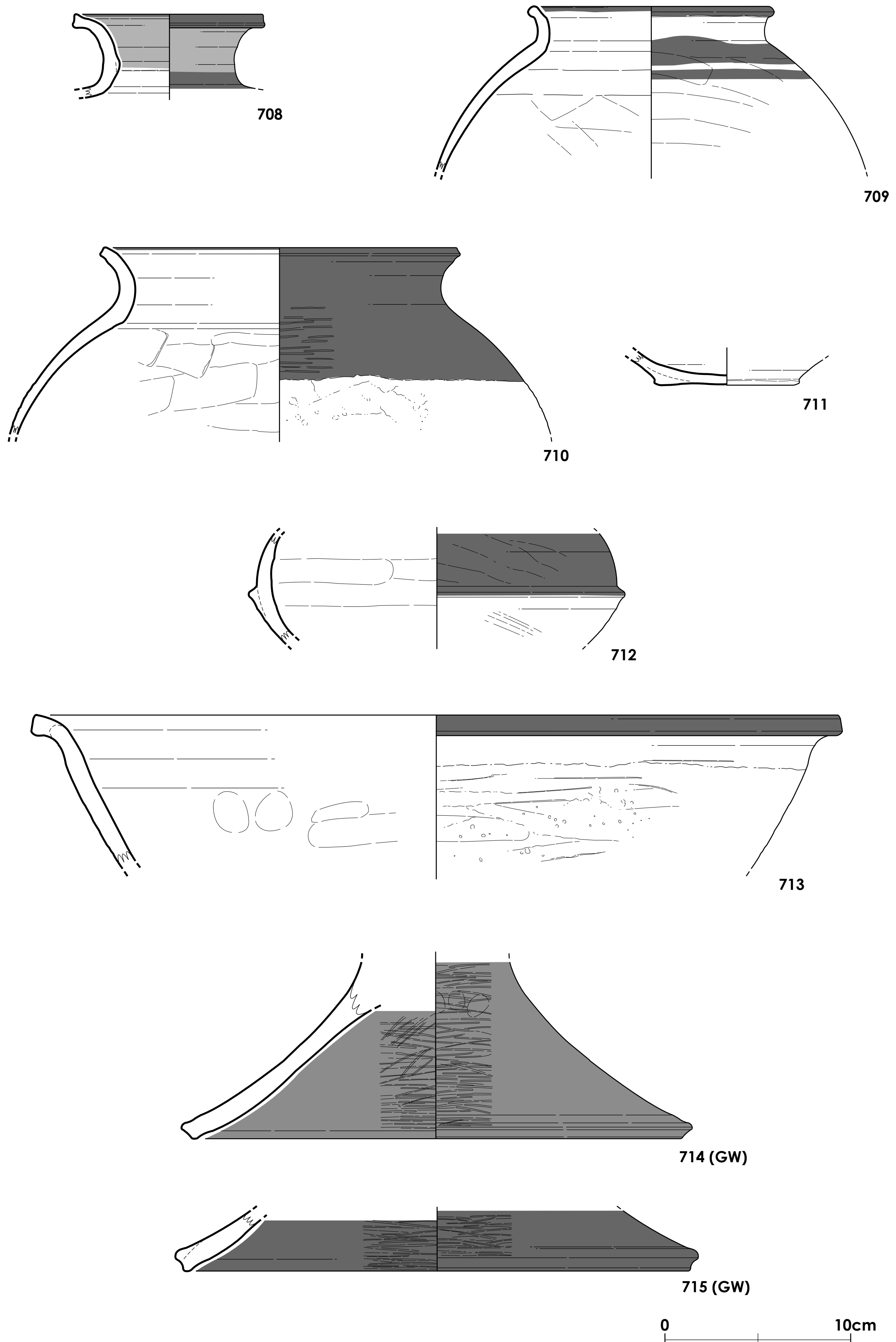


Figure 6.97 Pottery from Phase 2, Northwest Area (1:3)

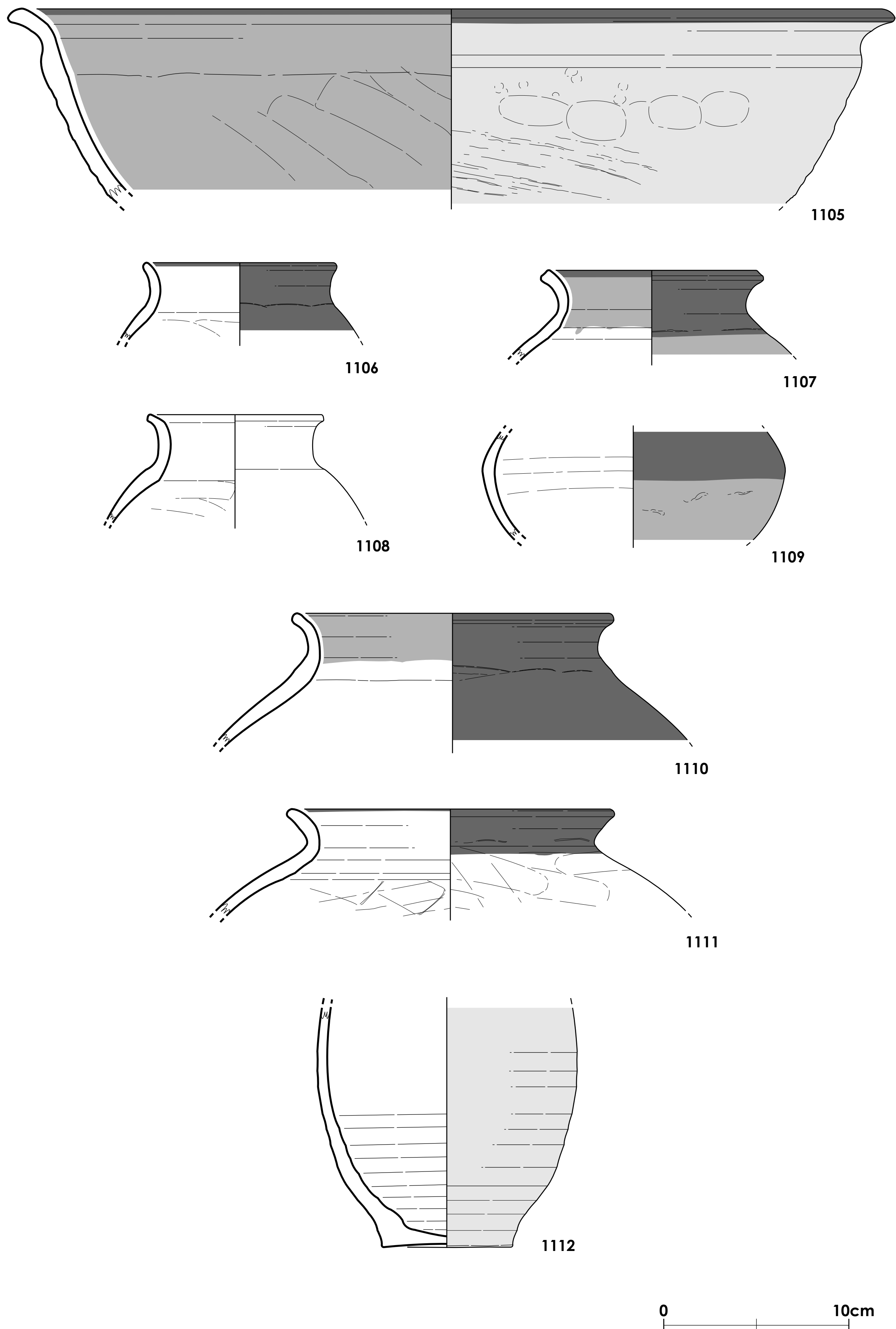


Figure 6.98 Pottery from Phase 2, Northwest Area (1:3)

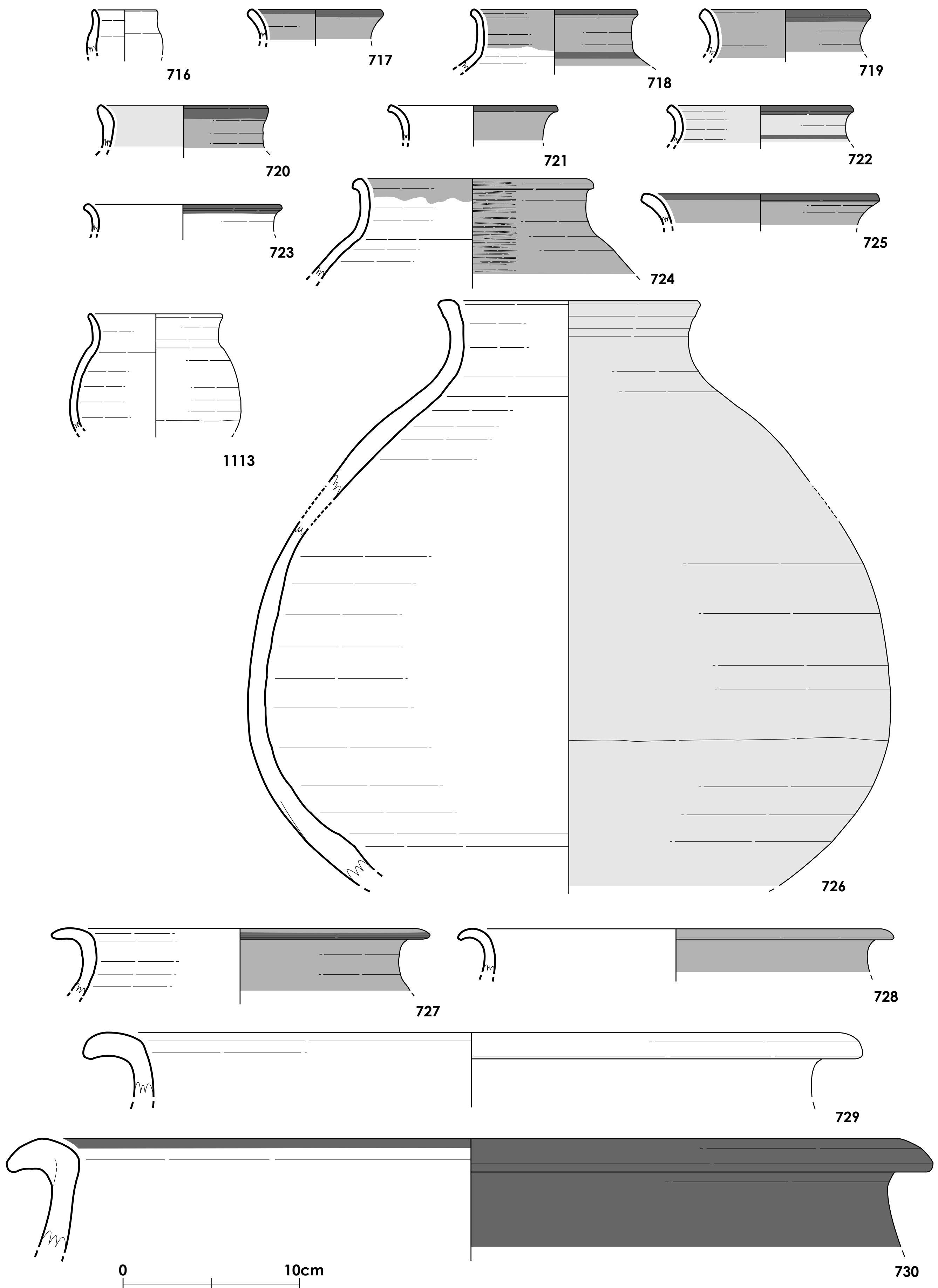


Figure 6.99 Pottery from Phase 2, Index Trench 2D9, North Extension (1:3)

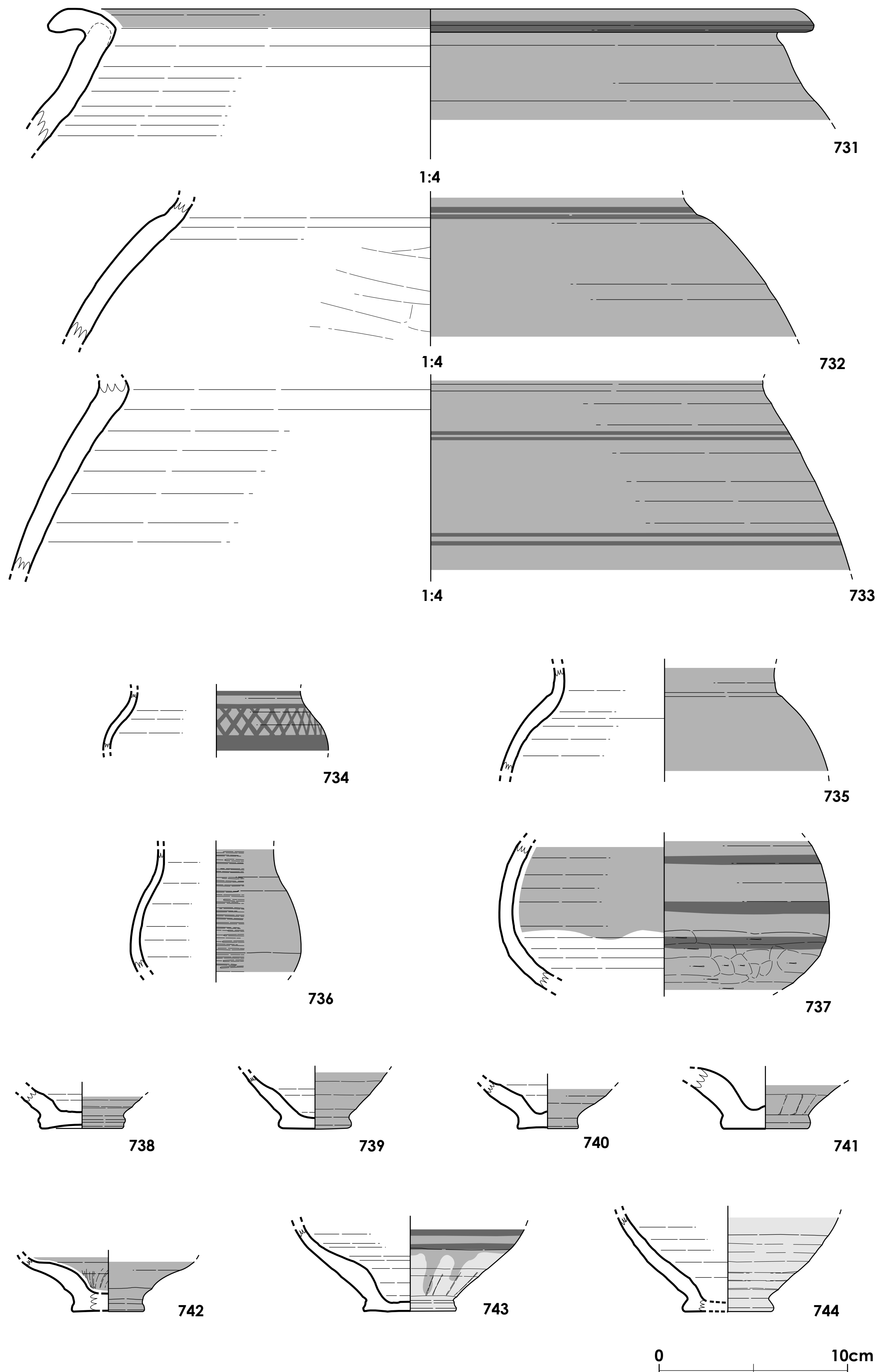


Figure 6.100 Pottery from Phase 2, Index Trench 2D9, North Extension (1:3)

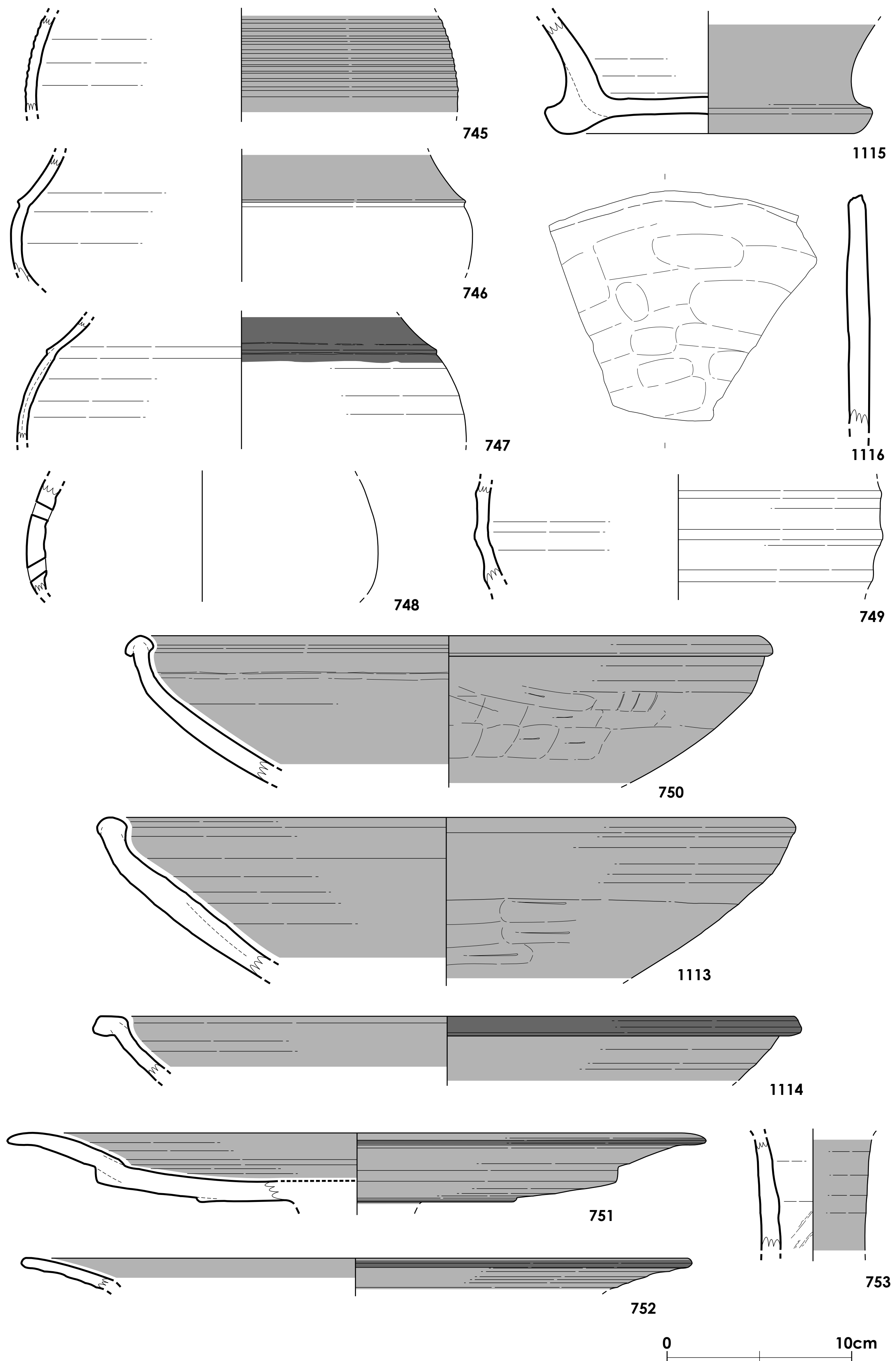


Figure 6.101 Pottery from Phase 2, Index Trench 2D9, North Extension (1:3)

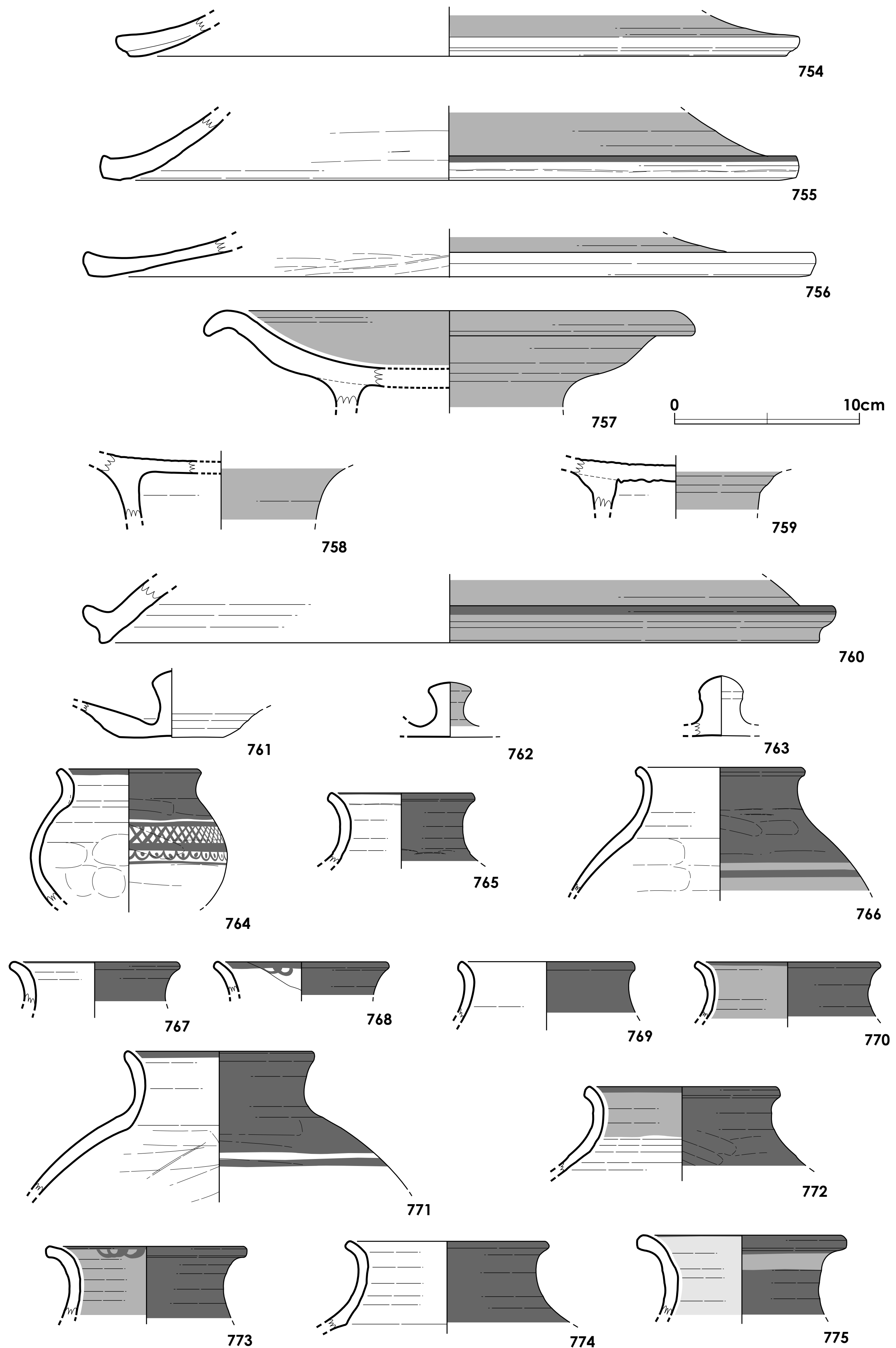


Figure 6.102 Pottery from Phase 2, Index Trench 2D9, North Extension (1:3)

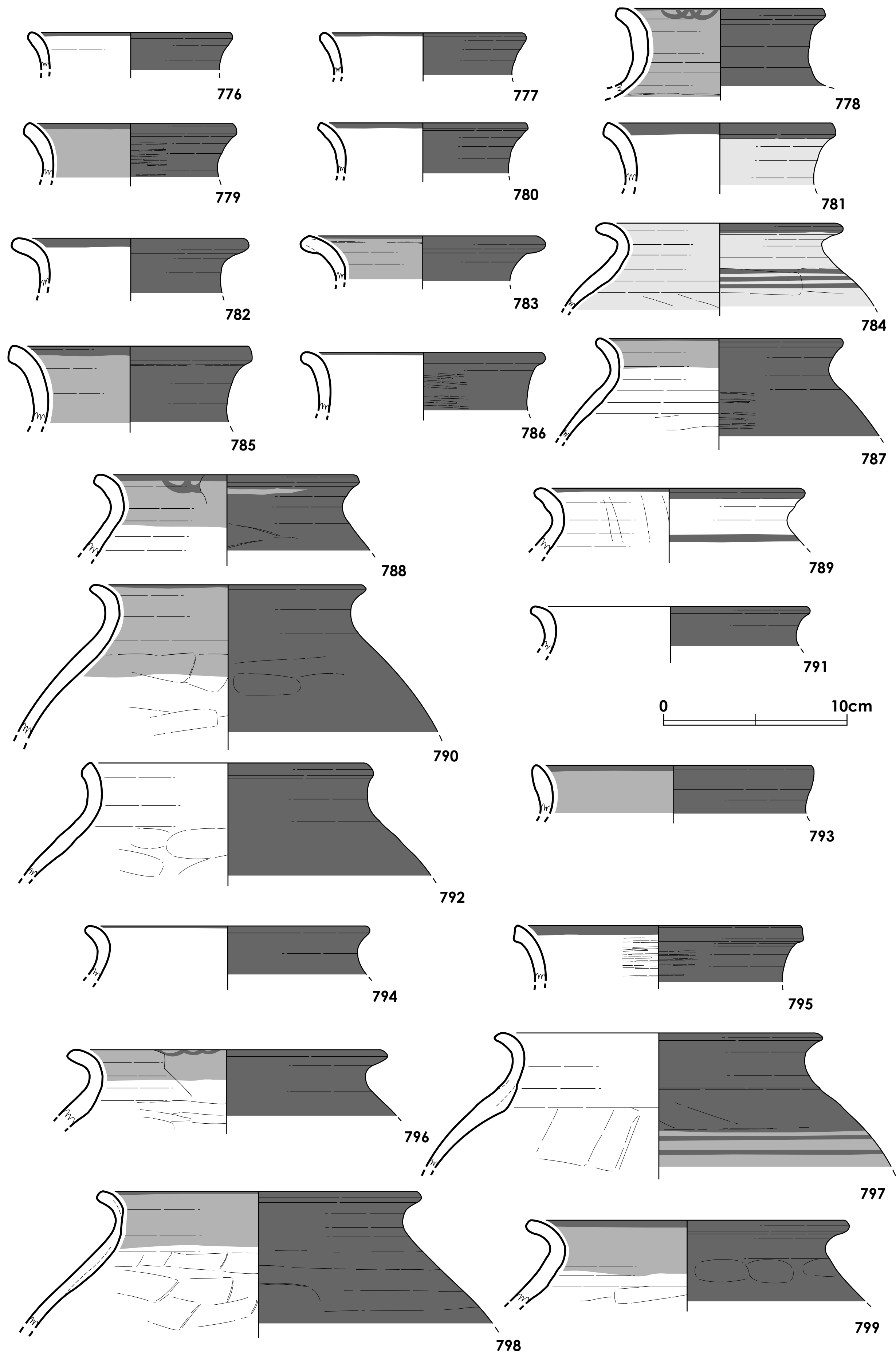


Figure 6.103 Pottery from Phase 2, Index Trench 2D9, North Extension (1:3)

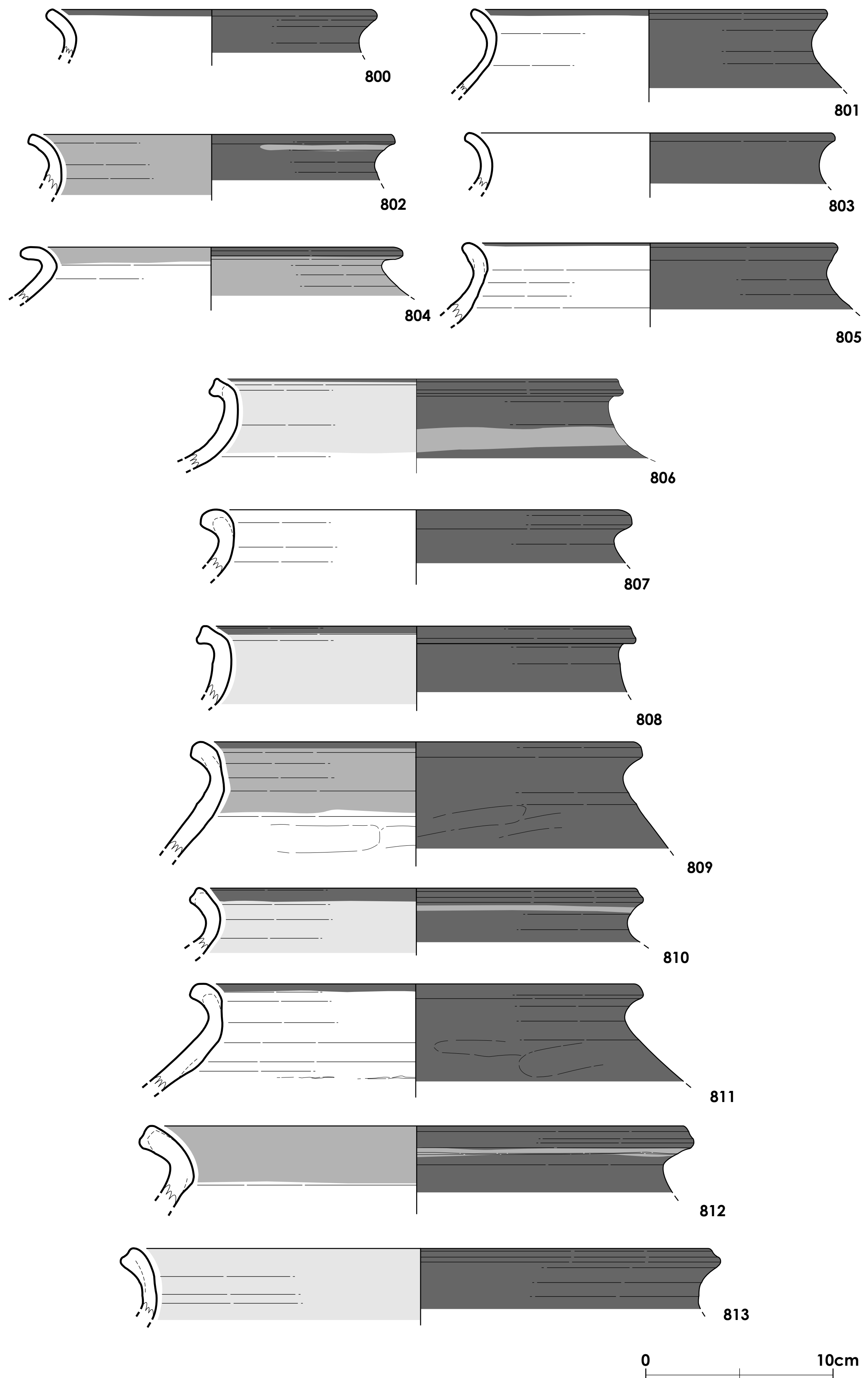


Figure 6.104 Pottery from Phase 2, Index Trench 2D9, North Extension (1:3)

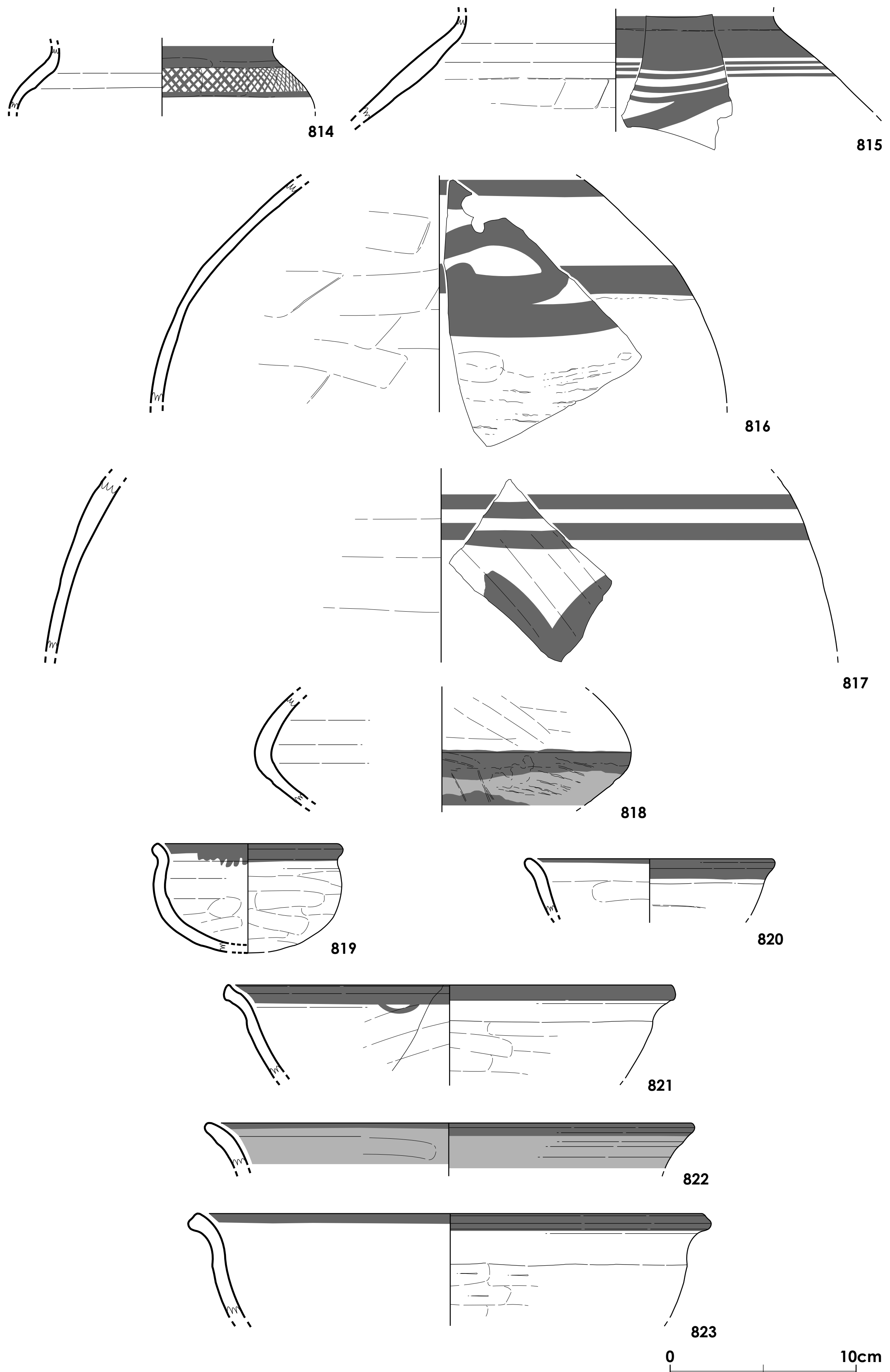


Figure 6.105 Pottery from Phase 2, Index Trench 2D9, North Extension (1:3)

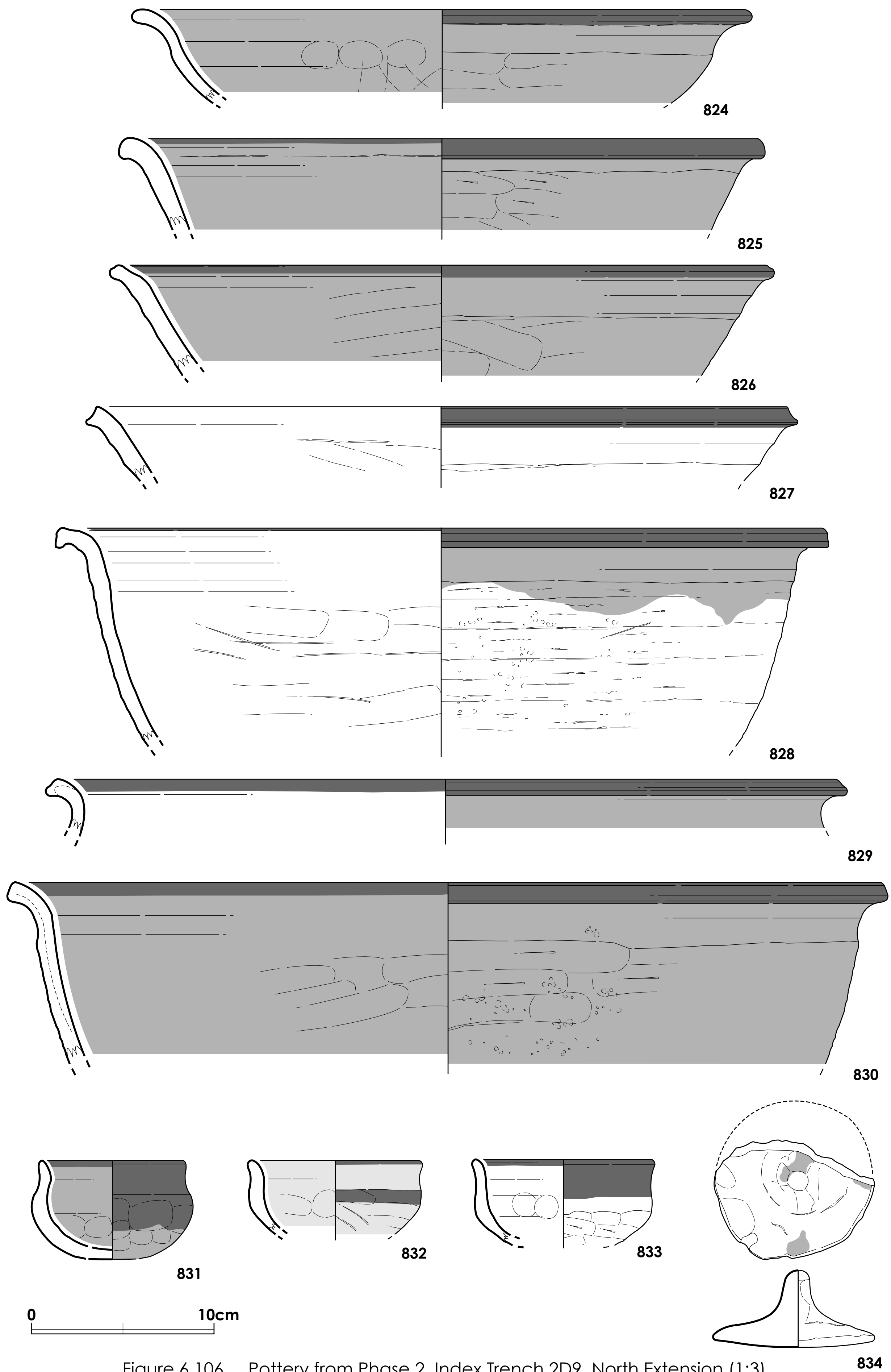


Figure 6.106 Pottery from Phase 2, Index Trench 2D9, North Extension (1:3)

000

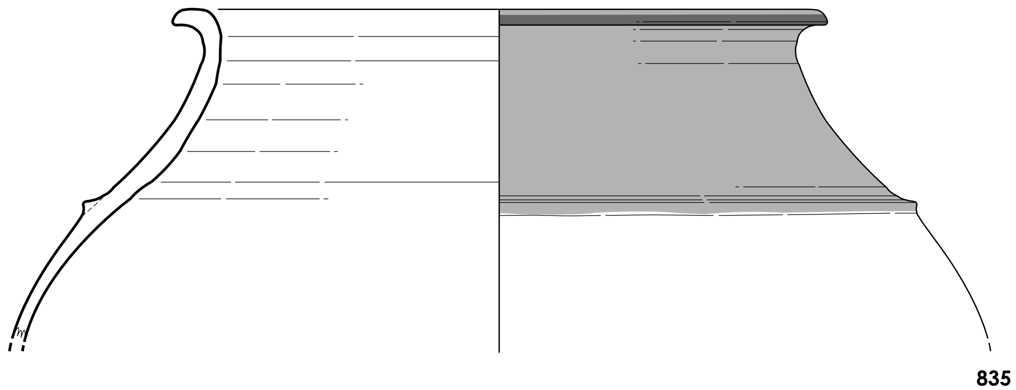


Figure 6.107 Pottery from Phase 3, Index Trench 2D9, North Extension (1:4)

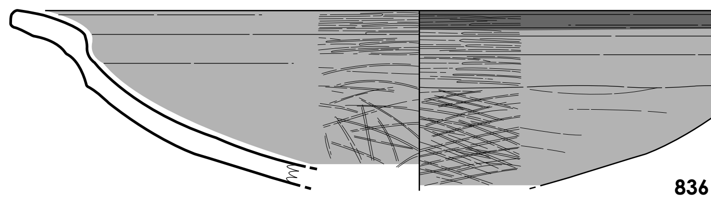


Figure 6.108 Pottery from Phase 4, Index Trench 2D9, North Extension (1:3)

837 838 839

840 841 842

843 844

845 846

847 848

0 10cm

849

850

Figure 6.109 Pottery from Phase 2, Trench 3, North Area (1:3)

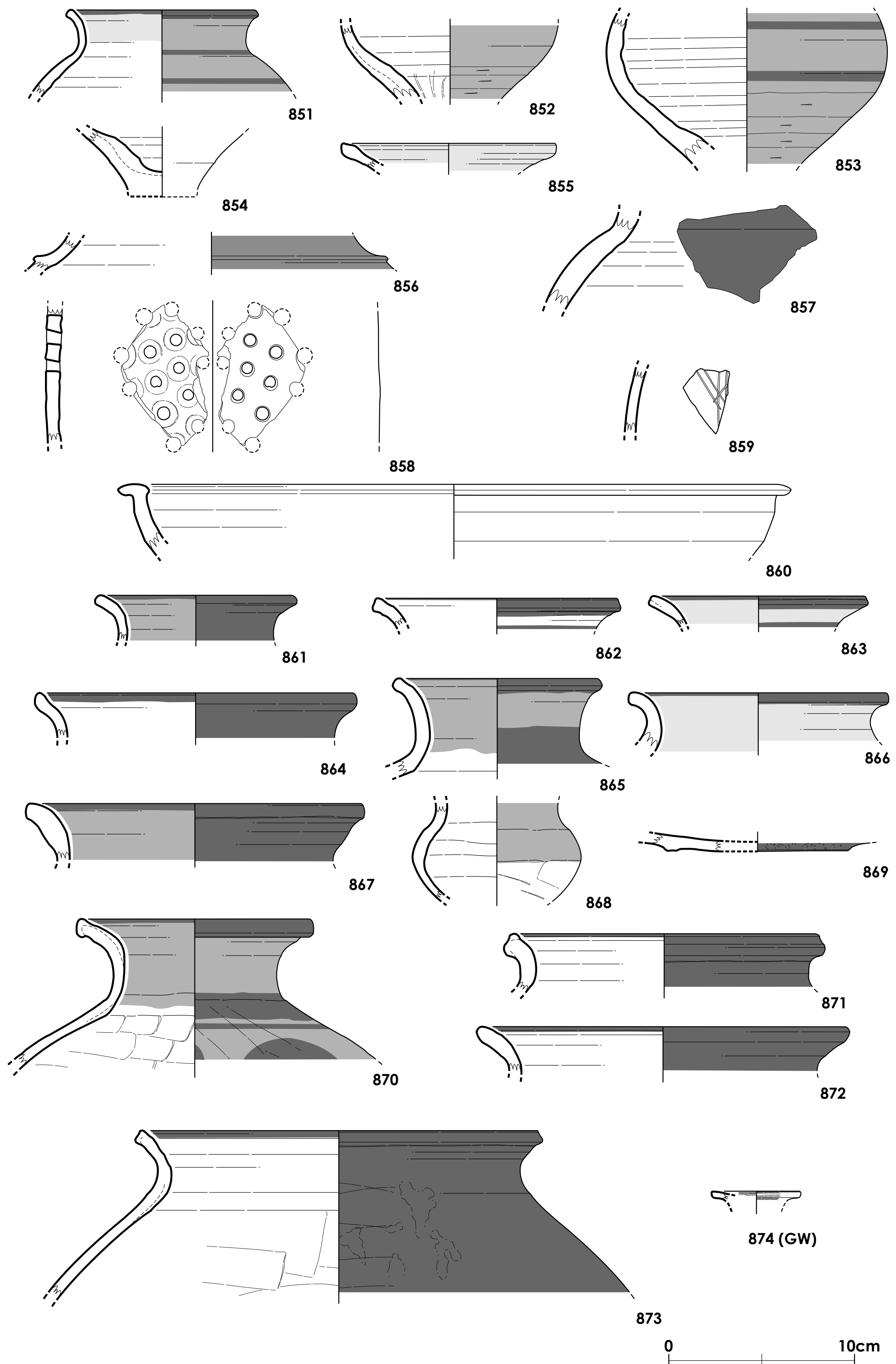


Figure 6.110 Pottery from Phase 2, Trench 3, North Area (1:3)

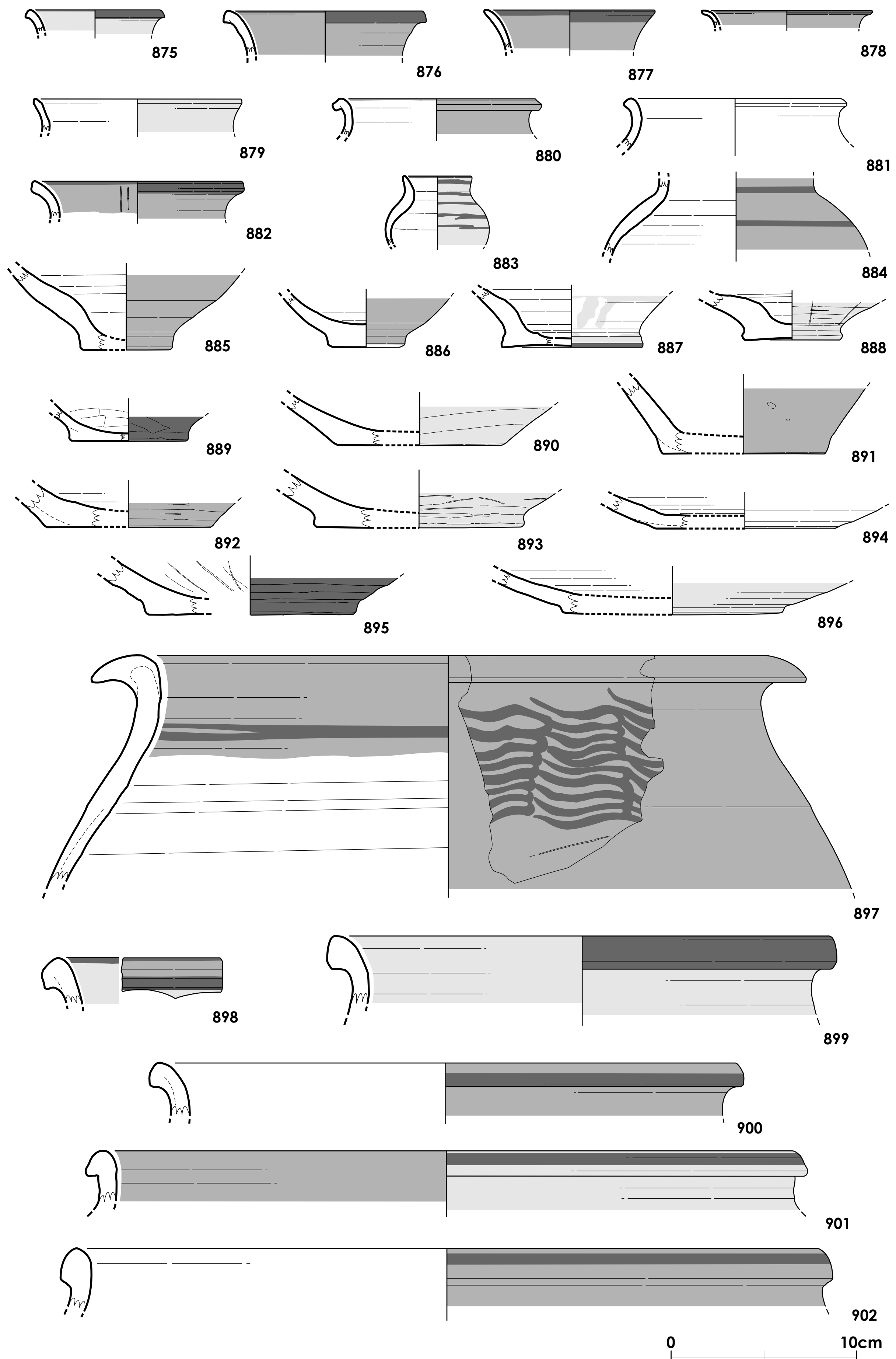


Figure 6.111 Pottery from Phase 3, Trench 3, North Area (1:3)

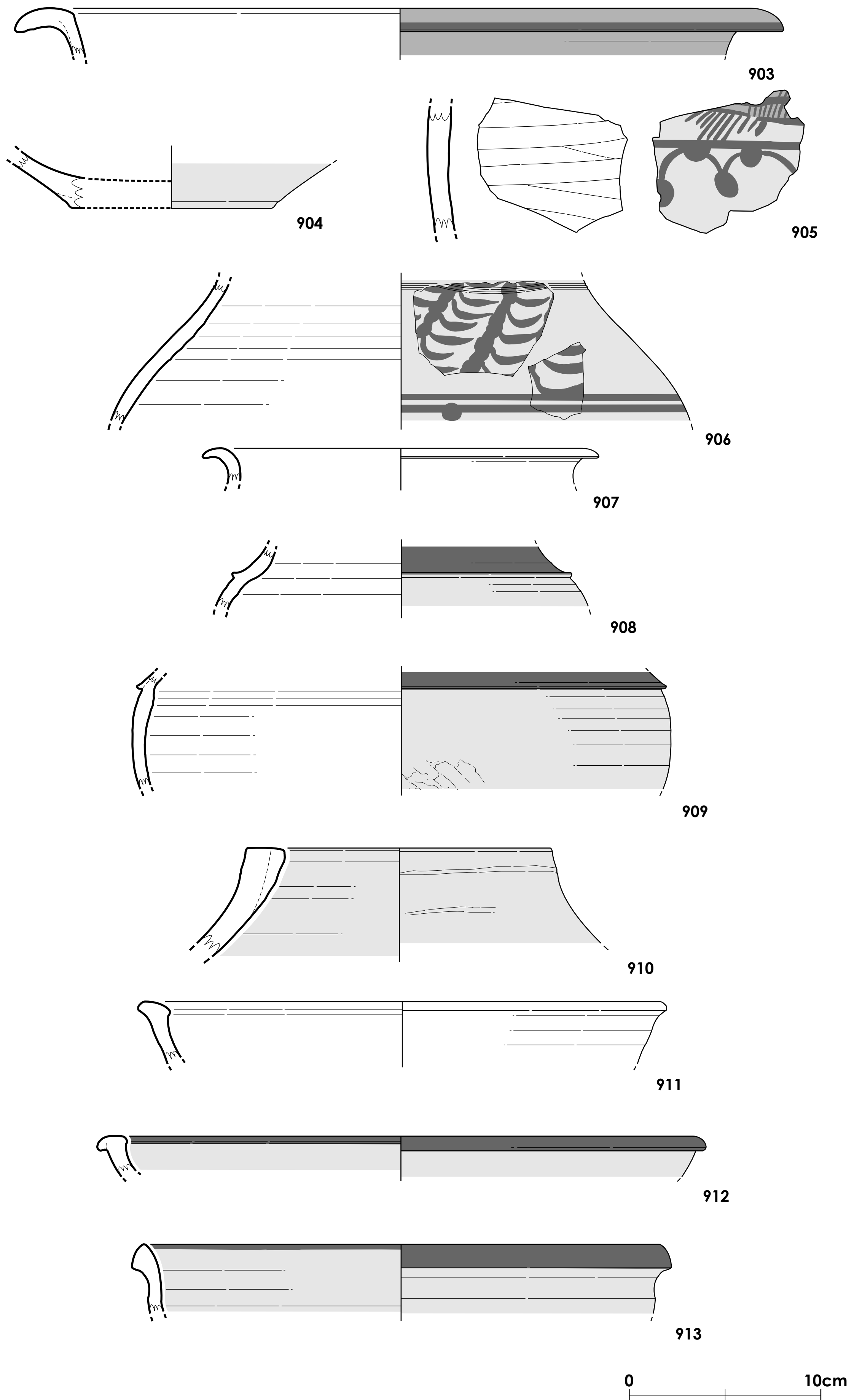


Figure 6.112 Pottery from Phase 3, Trench 3, North Area (1:3)

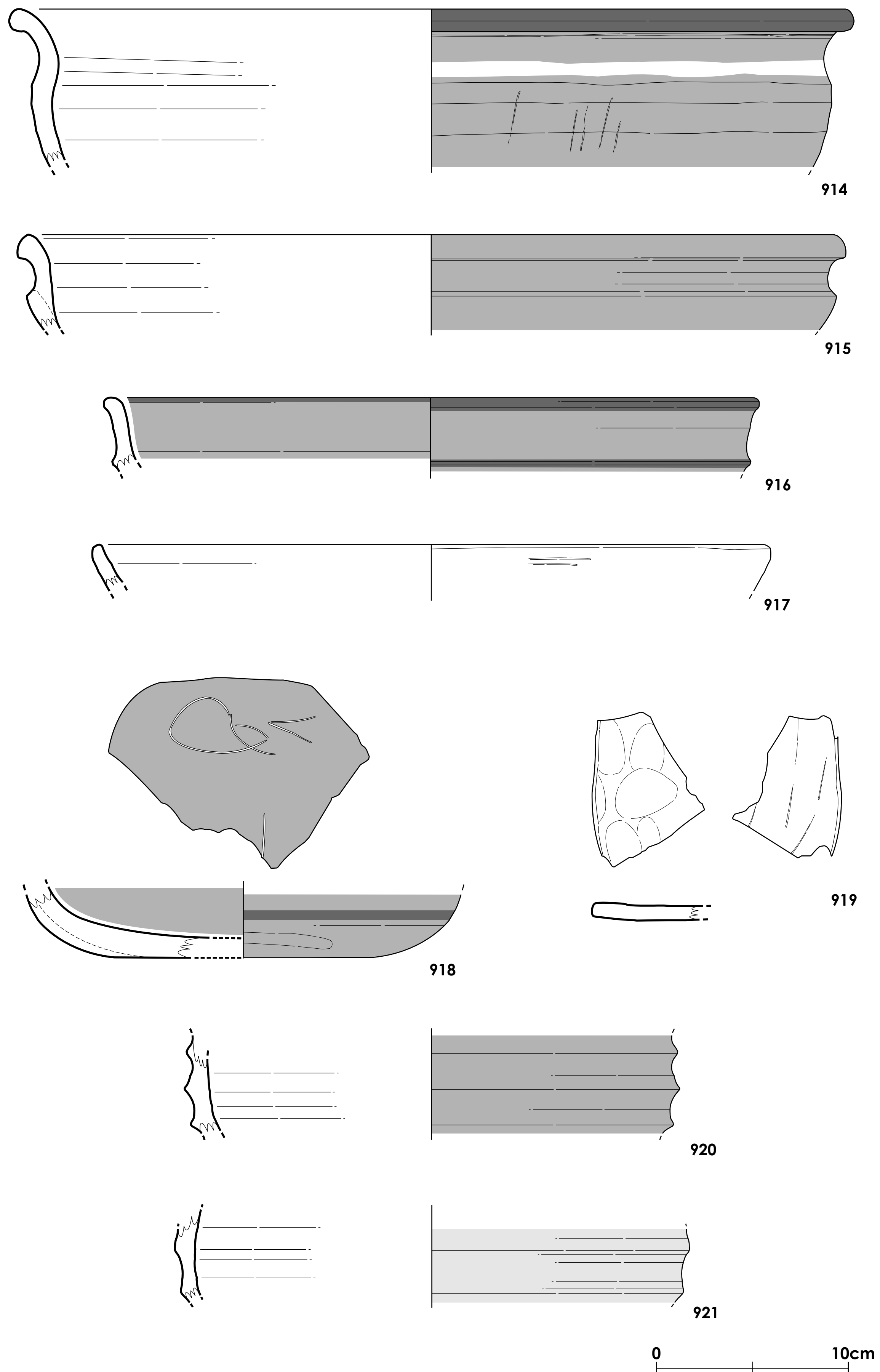


Figure 6.113 Pottery from Phase 3, Trench 3, North Area (1:3)

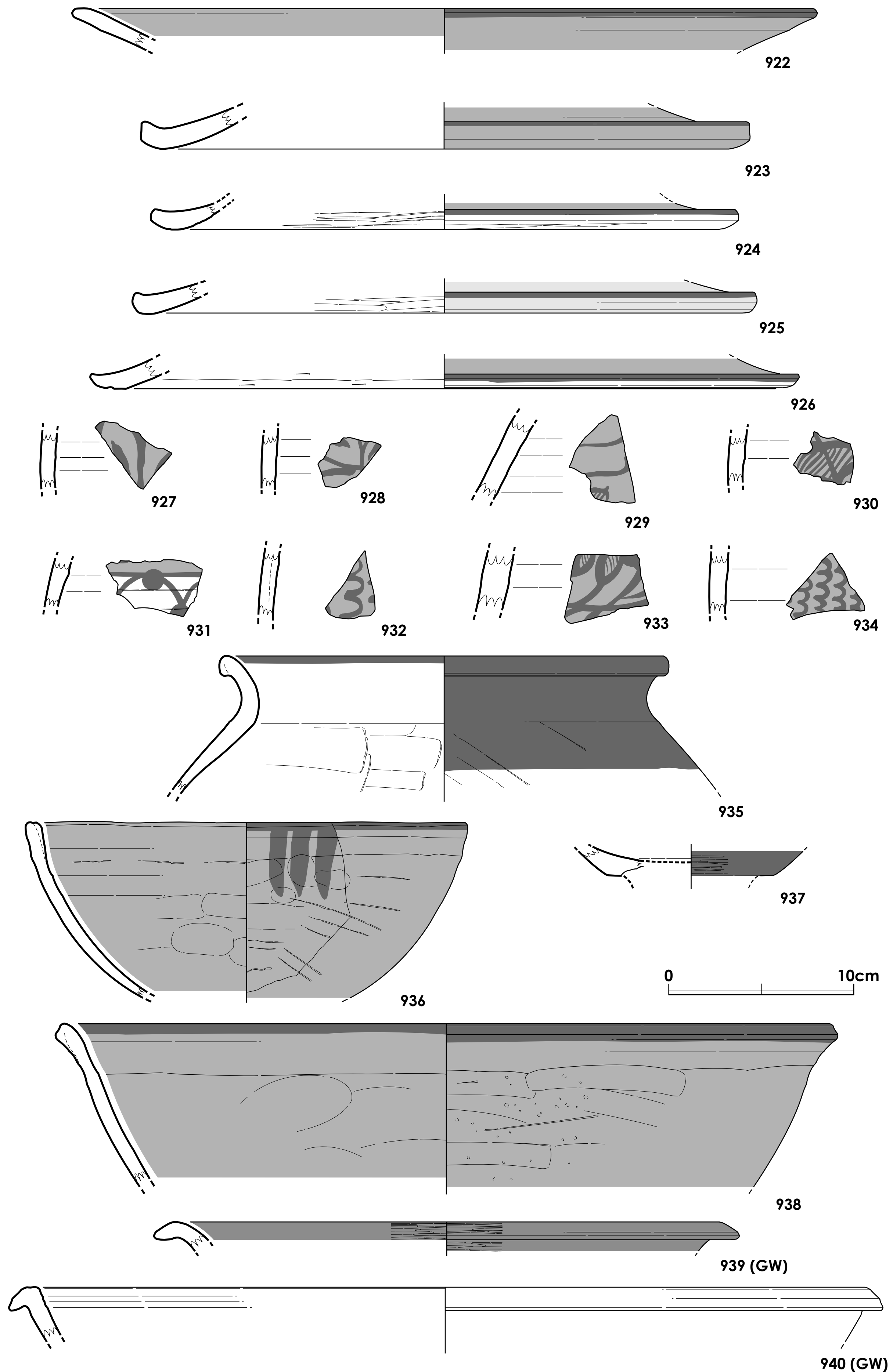


Figure 6.114 Pottery from Phase 3, Trench 3, North Area (1:3)

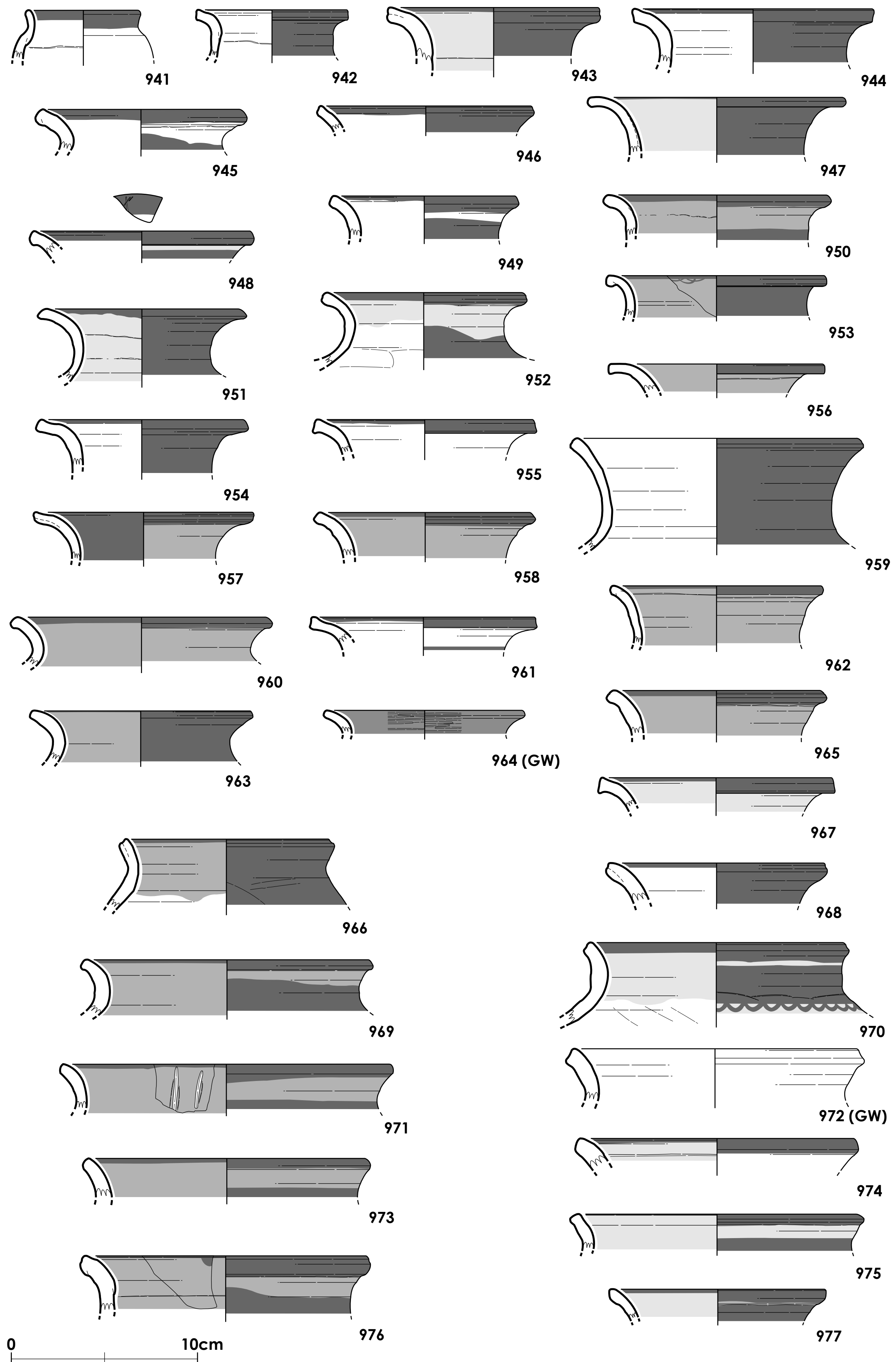


Figure 6.115 Pottery from Phase 3, Trench 3, North Area (1:3)

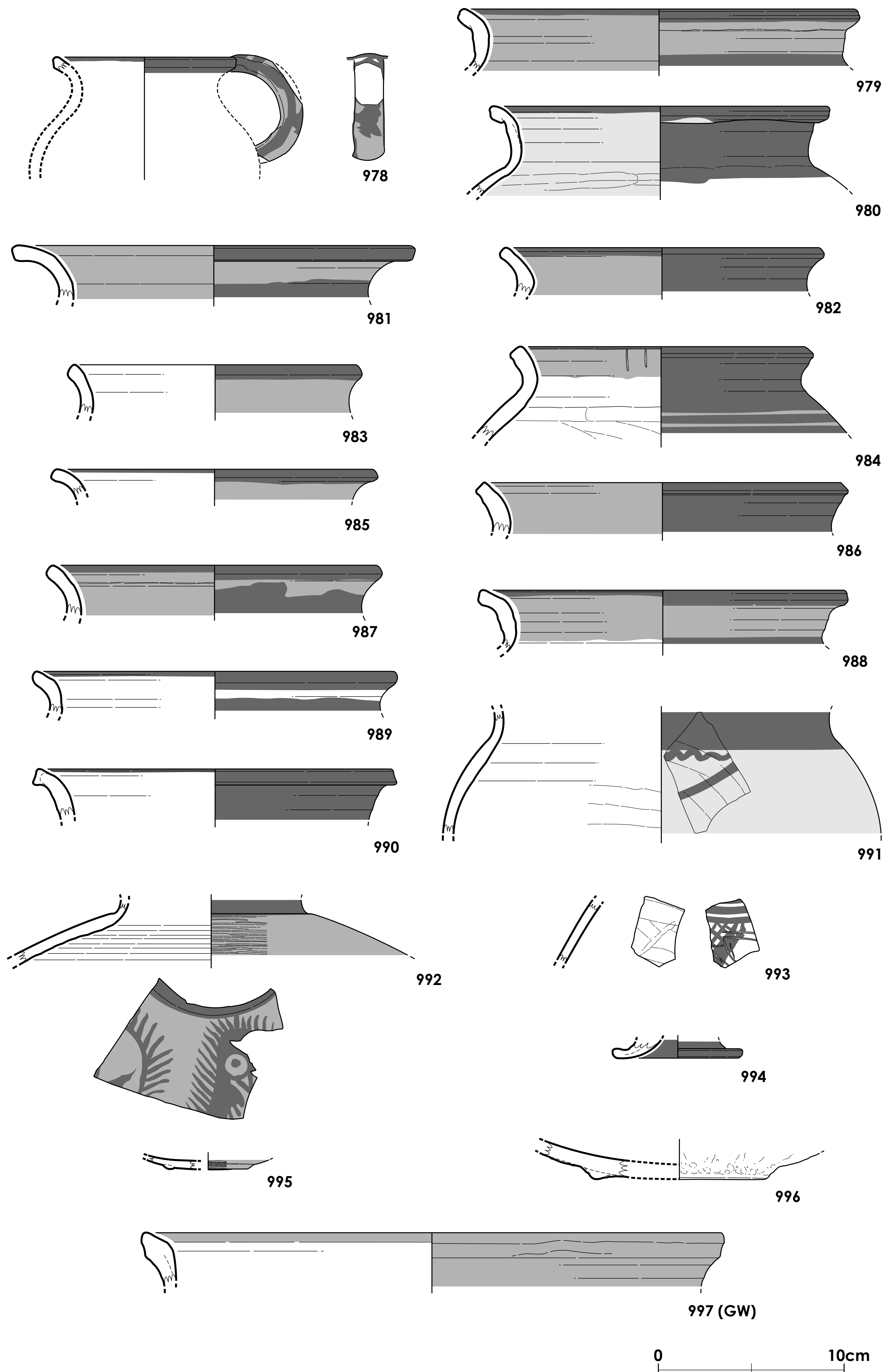


Figure 6.116 Pottery from Phase 3, Trench 3, North Area (1:3)

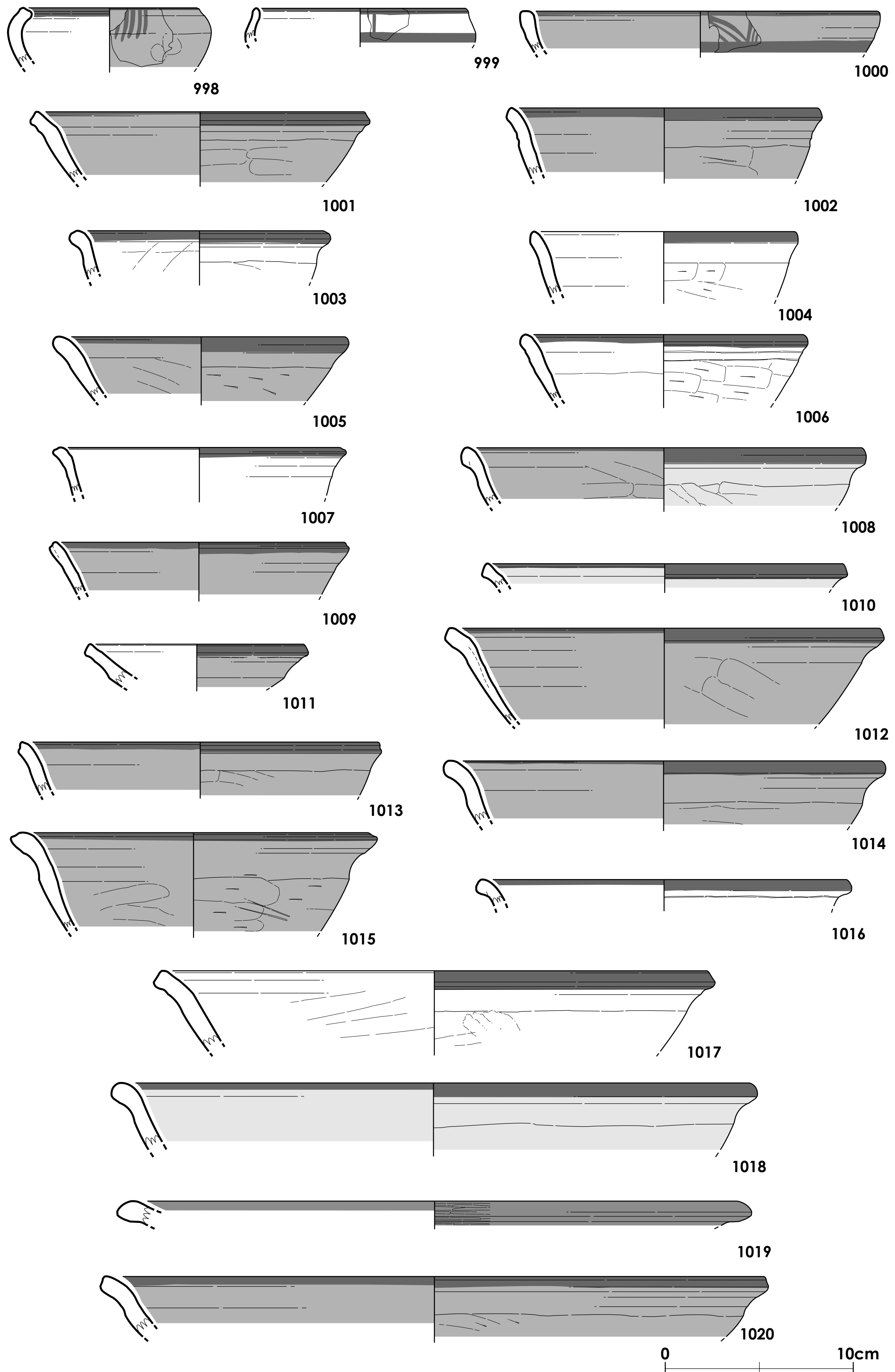


Figure 6.117 Pottery from Phase 3, Trench 3, North Area (1:3)

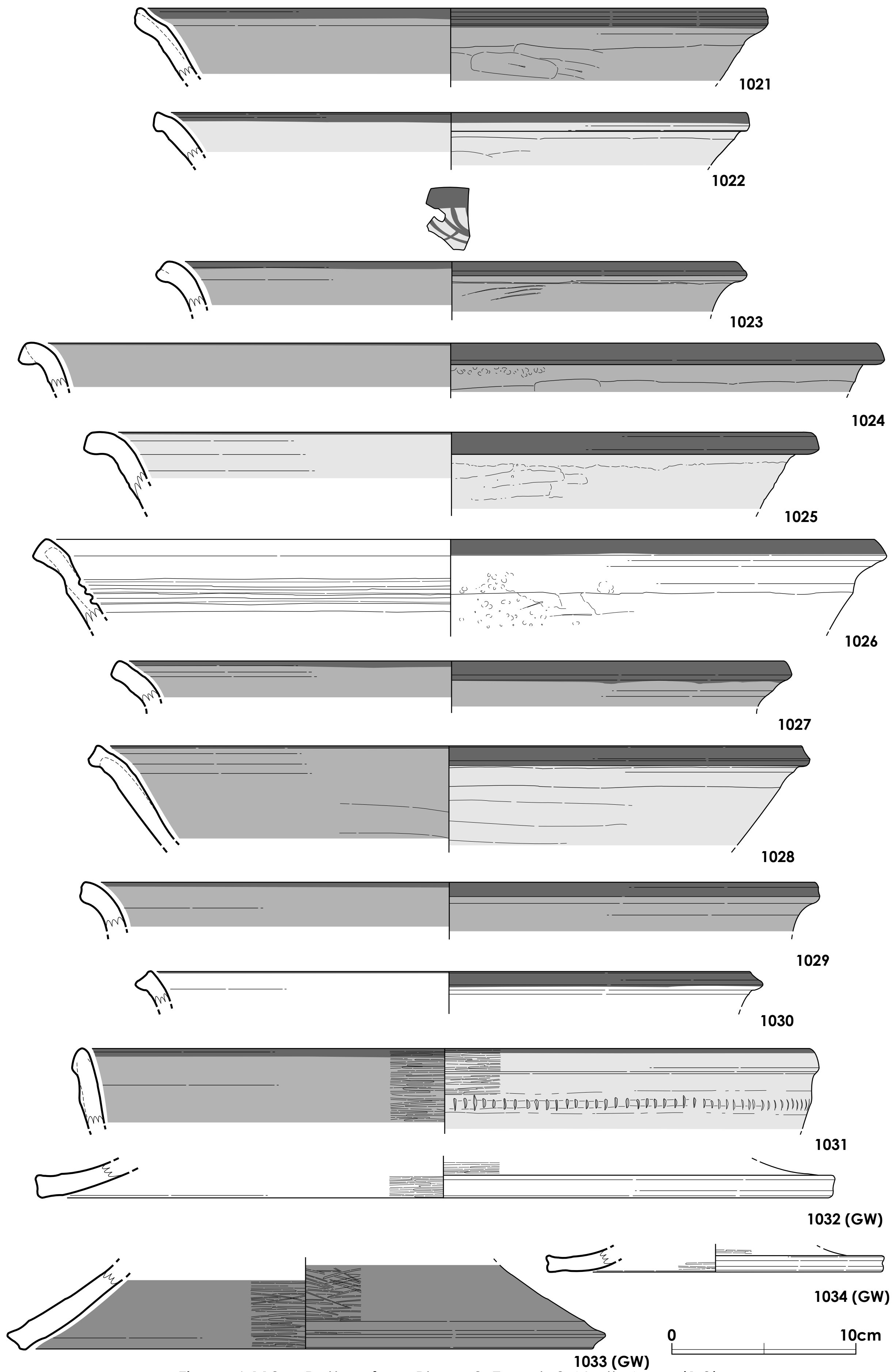


Figure 6.118 Pottery from Phase 3, Trench 3, North Area (1:3)

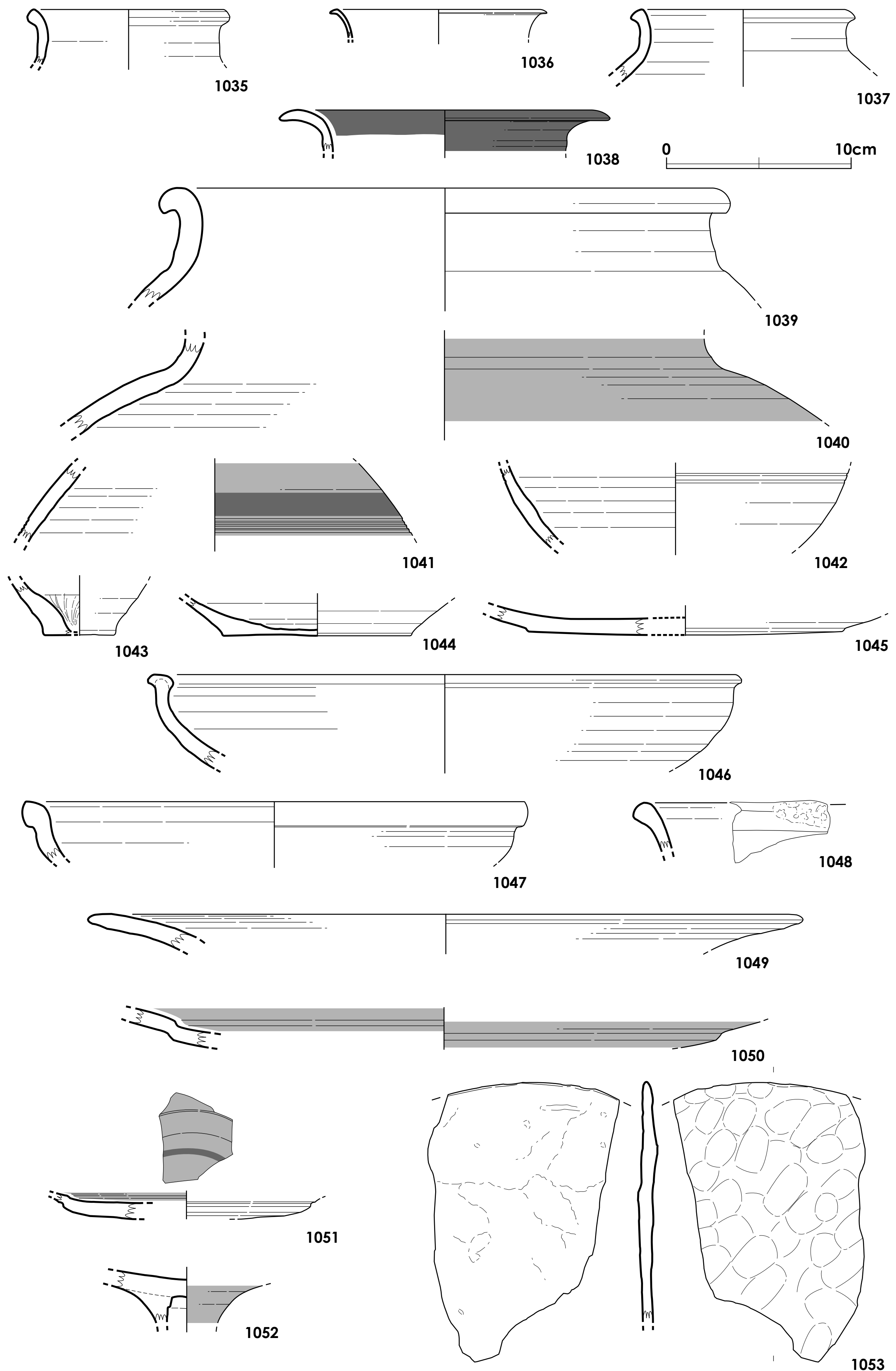


Figure 6.119 Pottery from Kiln Area (1:3)

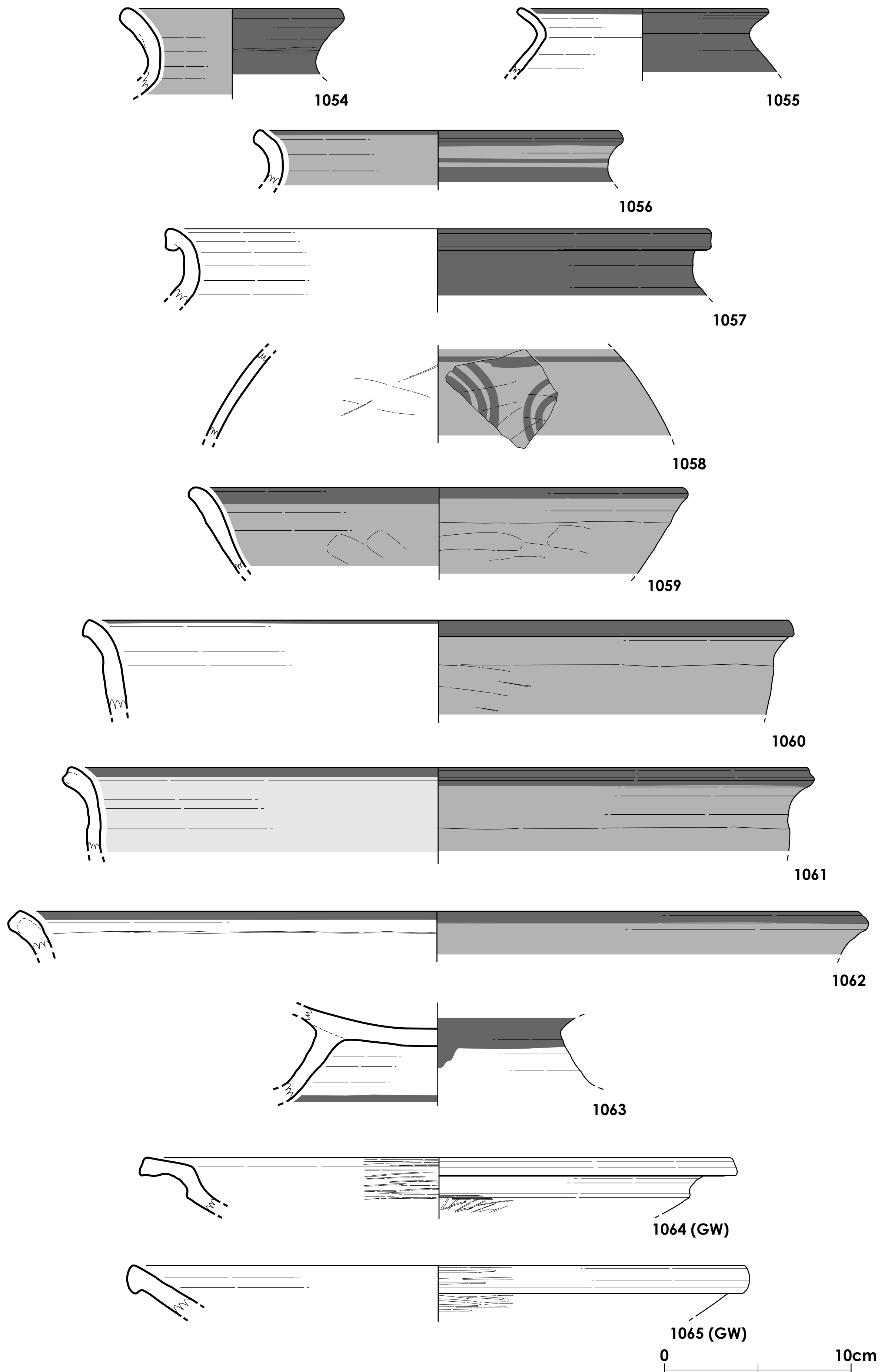


Figure 6.120 Pottery from Kiln Area (1:3)

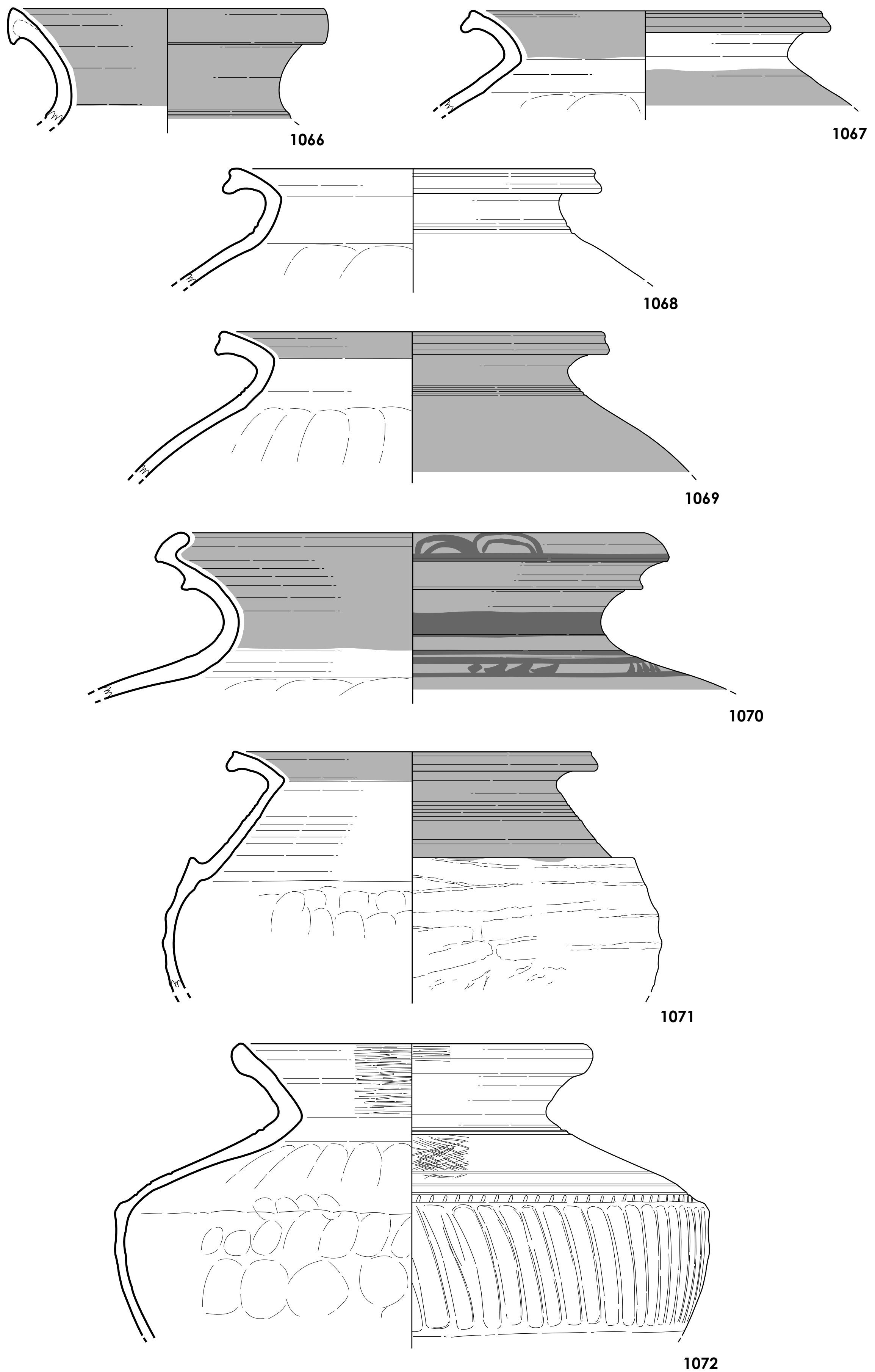


Figure 6.121 Historical Pottery from Central Area (1:3)

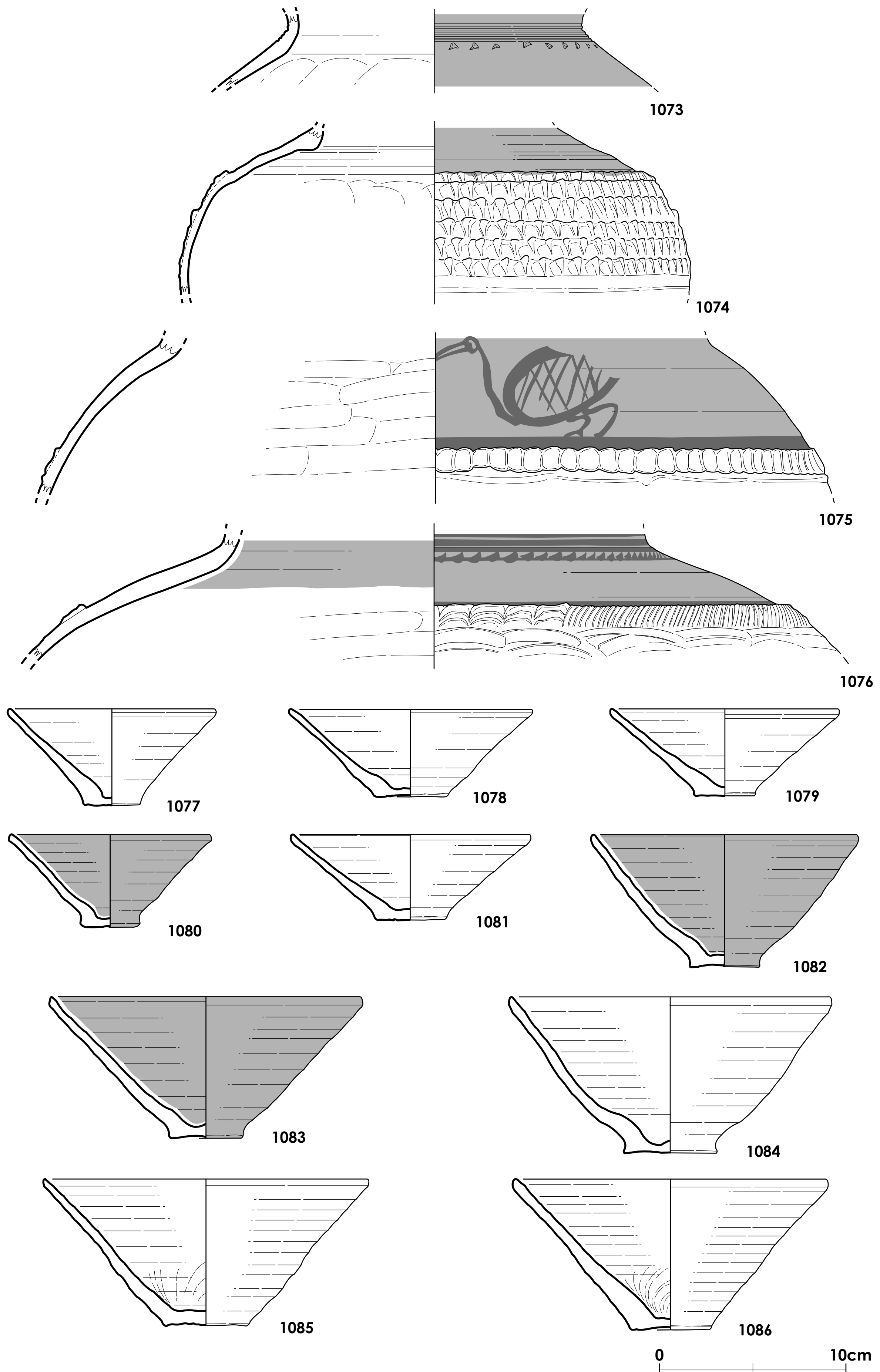


Figure 6.122 Historical Pottery from Central Area (1:3)

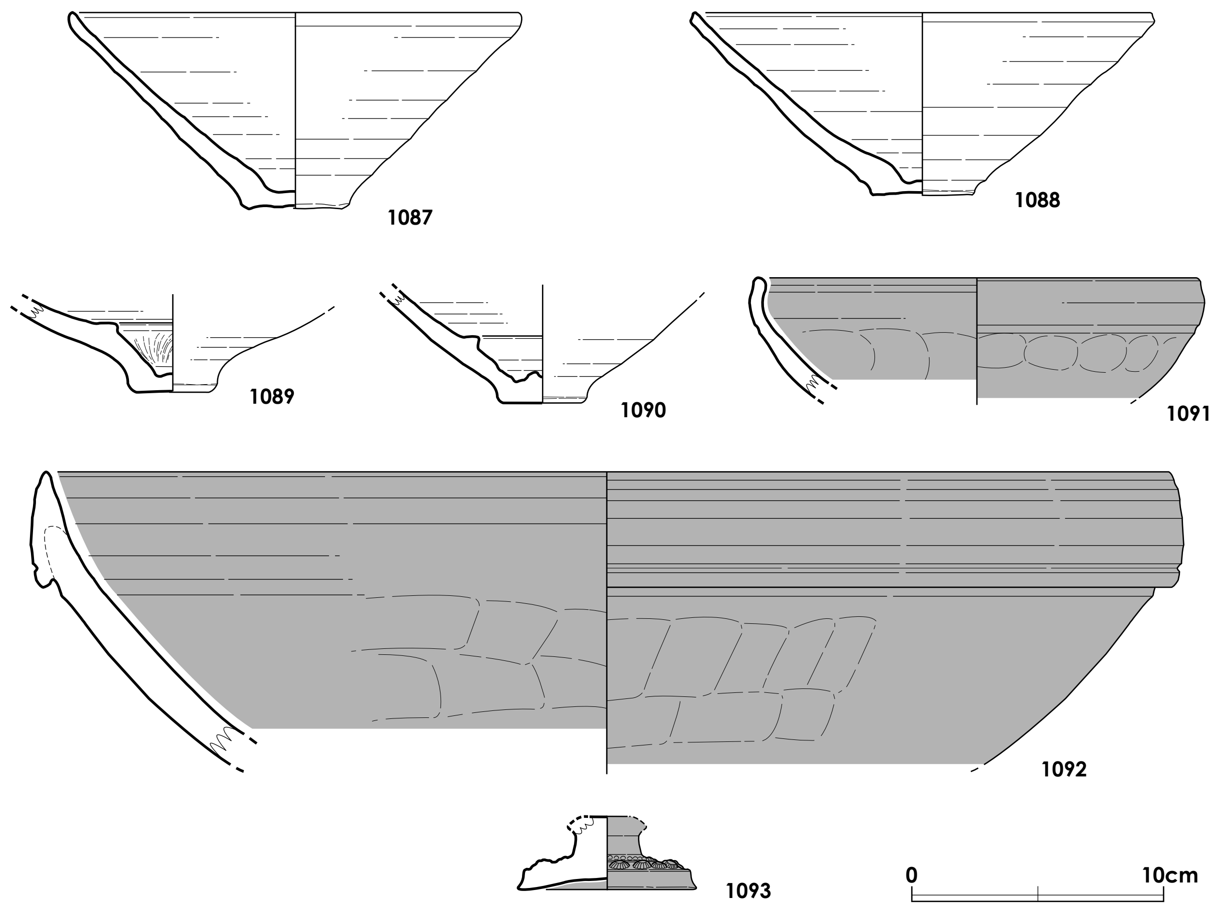


Figure 6.123 Historical Pottery from Central Area (1:3)



Figure 6.124 Harappan Pottery (1:2)



Figure 6.125 Harappan Pottery (1:2)



Figure 6.126 Harappan Pottery (1:2)



Figure 6.127 Harappan Pottery (1:2)



Figure 6.128 Harappan Potteryt



Figure 6.129 Harappan Pottery (1:2)



Figure 6.130 Harappan Pottery (1:2)



Figure 6.131 Harappan Pottery (1:2)



Figure 6.132 Harappan Pottery (1:2)



Figure 6.133 Harappan Pottery (1:2)



Figure 6.134 Harappan Pottery (1:2)



Figure 6.135 Harappan Pottery (1:2)



Figure 6.136 Harappan Pottery (1:2)



Figure 6.137 Harappan Pottery (1:2)



Figure 6.138 Harappan Pottery (1:2)



Figure 6.139 Harappan Pottery (1:2)



Figure 6.140 Harappan Pottery (1:2)



Figure 6.141 Harappan Pottery (1:2)



Figure 6.142 Harappan and Non-Harappan Pottery (1:2)



Figure 6.143 Harappan Pottery (1:2)



Figure 6.144 Harappan Pottery (1:2)



Figure 6.145 Harappan Pottery (1:2)



Figure 6.146 Harappan and Non-Harappan Pottery (1:2)



Figure 6.147 Harappan Pottery (1:2)



Figure 6.148 Harappan Pottery (1:2)



Figure 6.149 Non-Harappan Pottery (1:2)



Figure 6.150 Non-Harappan Pottery (1:2)



Figure 6.151 Non-Harappan Pottery (1:2)



Figure 6.152 Non-Harappan Pottery (1:2)



Figure 6.153 Non-Harappan Pottery (1:2)



Figure 6.154 Non-Harappan Pottery (1:2)



Figure 6.155 Non-Harappan Pottery (1:2)



Figure 6.156 Non-Harappan Pottery (1:2)



Figure 6.157 Non-Harappan Pottery (1:2)



Figure 6.158 Harappan and Non-Harappan Pottery (1:2)



Figure 6.159 Harappan Pottery (1:2)



Figure 6.160 Non-Harappan Pottery (1:2)



Figure 6.161 Non-Harappan Pottery (1:2)



Figure 6.162 Non-Harappan Pottery (1:2)



Figure 6.163 Non-Harappan Pottery (1:2)



Figure 6.164 Non-Harappan Pottery (1:2)



Figure 6.165 Non-Harappan Pottery (1:2)



Figure 6.166 Non-Harappan Pottery (1:2)



Figure 6.167 Non-Harappan Pottery (1:2)



Figure 6.168 Non-Harappan Pottery (1:2)



Figure 6.169 Non-Harappan Pottery (1:2)



Figure 6.170 Non-Harappan Pottery (1:2)



Figure 6.171 Non-Harappan Pottery (1:2)



Figure 6.172 Non-Harappan Pottery (1:2)



Figure 6.173 Non-Harappan Pottery (1:2)



Figure 6.174 Non-Harappan Pottery (1:2)



Figure 6.175 Non-Harappan Pottery (1:2)



Figure 6.176 Non-Harappan Pottery (1:2)



Figure 6.177 Non-Harappan Pottery (1:2)



Figure 6.178 Non-Harappan Pottery (1:2)



Figure 6.179 Non-Harappan Pottery (1:2)



Figure 6.180 Non-Harappan Pottery (1:2)



Figure 6.181 Non-Harappan Pottery (1:2)



Figure 6.182 Non-Harappan Pottery (1:2)



Figure 6.183 Non-Harappan Pottery (1:2)



Figure 6.186 Non-Harappan Pottery (1:2)



Figure 6.185 Non-Harappan Pottery (1:2)



Figure 6.186 Non-Harappan Pottery (1:2)



Figure 6.188 Non-Harappan Pottery (1:2)



Figure 6.190 Non-Harappan Pottery (1:2)



Figure 6.191 Non-Harappan Pottery (1:2)



Figure 6.192 Non-Harappan Pottery (1:2)

CHAPTER 7

MINOR OBJECTS FROM THE SETTLEMENT AREA

by Ayumu Konasukawa, Hitoshi Endo and Akinori Uesugi

1 GENERAL OUTLINE

A total number of 16404 minor objects were recovered from the excavations at Farmana. In the course of excavations, objects were collected based on the 5 m × 5 m grid, but many tiny objects were found in sieving making it difficult to identify their original contexts or their relation to specific layers and structures. Therefore, in a strict sense, a detailed documentation of the contexts of the minor objects was not made.

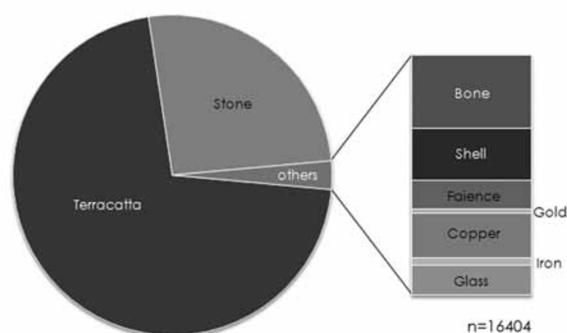
After excavations, the objects were registered with serial numbers, and their material, formal features and measurements were recorded. Based on this database, representative specimens were selected for illustration and photography.

The material distribution is shown in Table 7.1. Terracotta objects are dominant due to an enormous number of terracotta bangle fragments (11677 pieces). This is followed by stone objects (4256 specimens), of which beads make up the largest portion (95 % of stone objects / 4044 specimens), primarily due to a large number of tiny steatite beads. It is then followed by bone (142 specimens), shell (102 specimens), and copper objects (89 specimens, most of which are fragmentary in nature). Glass and iron objects are clearly considered as belonging to the Historical period.

In the uppermost layers, pits yielding Historical objects were cut into the stratigraphy and structural remains of the Harappan period. However, some Historical pits were not distinguished in the excavations, resulting in a vagueness of the original contexts and the cultural periods to which those objects should have belonged. Some glass and iron objects fall into this category. Although some Historical pits were dug deeply into the Harappan levels, most of them were found not to reach to the deeper levels, i.e. lower than Phase 4 in the Central Area and lower than Phase 3 in other areas. This

Table 7.1 Numbers of artefacts in material-wise

Material	*Total*
Terracotta	11677
Stone	4256
Bone	142
Shell	102
Faience	58
Gold	7
Copper	89
Iron	15
Glass	58
Total	16404



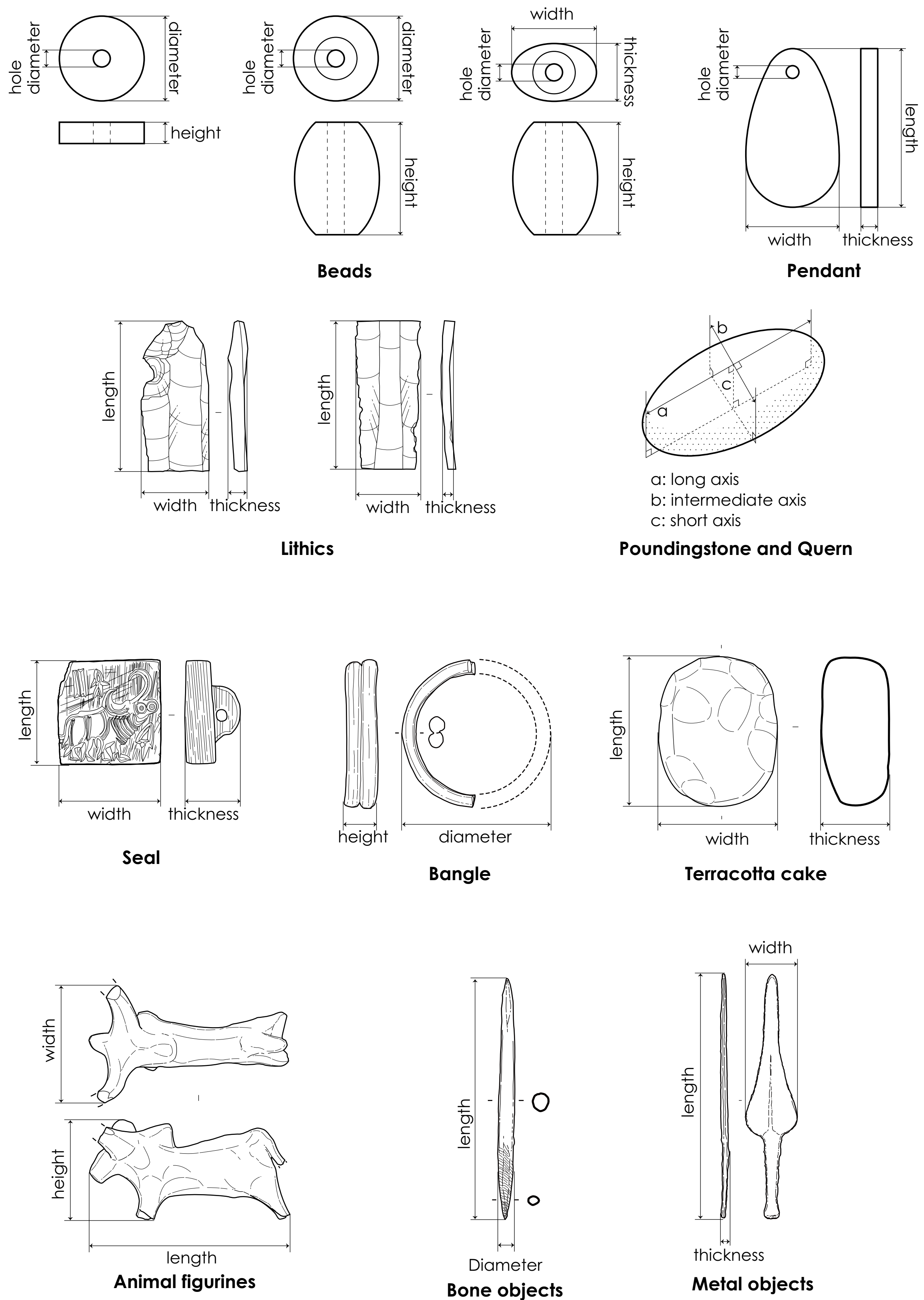


Figure 7.1 Measurements for various artefacts

means that the Harappan stratigraphy was well preserved except for the uppermost levels, suggesting that objects found in levels below the uppermost ones belong to the Harappan period.

Among the minor objects found in the uppermost levels in each area, some objects cannot be attributed to specific periods based solely on their formal features and the materials used, whereas other objects can be clearly identified as Harappan or Historical based on their features. For example, it is difficult to determine their date of some of the terracotta and copper objects, as those materials and formal features may be common both in the Harappan and Historical periods. Therefore, those objects found in the uppermost levels should be treated carefully.

The measurements were made based on the method illustrated in Figure 7.1.

Regarding the artefact no., they are indicated in serial section-wise. For example, 1, 2, 3 ... for seals and their associated objects and another 1, 2, 3... for terrcoatta objects. To distinguish the artefact no. and other numericals, the artefact no. are given with alphabets as following, while they are indicated only in numerals in figures.

S = seals and objects with seal impressions
T = terracotta objects
St = stone objects
F = faience objects
Sh = shell objects
B = Bone objects
M = metal objects including gold, copper and iron objects
G = glass obejcts

In this chapeter, as in Chapter 6, the division of the Central Area, East Area, West Area, Northwest Area, North Extension and North Area is used for specifying and simplifying the findspot of each specimens (see Figure 5.1). In addition, a stratigraphic division of the entire mound into five phases is made based on a comparison of the absolute levels of floors and structures among excavated areas (see Chapter 4), in order to specify the stratigraphic position and context of pottery.

It is noted that the information on the provenance (the area, trench, stratigraphic position) and detailed measurements of each specimen are found in the attached CD.

(Uesugi)

2 SEALS AND OBJECTS WITH SEAL IMPRESSIONS

2.1 Outline

Four specimens of steatite seals and two specimens of terracotta objects with seal impressions were unearthed in the excavations. The steatite

Table 7.2 Details of steatite seals

No.	Area	Trench	Phase	Length (mm)	Width (mm)	Thickness (with boss) (mm)	Thickness (without boss) (mm)	Weight
S-1	North Area	2	4	20.65	20.13	11.0	5.55	5.25
S-2	East Area	2XD5	4	21.02	21.32	12.36	5.14	5.98
S-3	Central Area	1H8	5	26.97	27.36	12.7	7.79	13.66
S-4	Central Area	1B6	5	29.74	24.82+	12.43	6.93	8.27+

Table 7.3 Details of objects with seal impressions

No.	Area	Trench	Phase	Length (mm)	Width (mm)	Thickness (mm)
S-5	North Area	3	4	30.0+	33.0+	12.0
S-6	Central Area	1C2	5	33.9+	36.2+	17.5

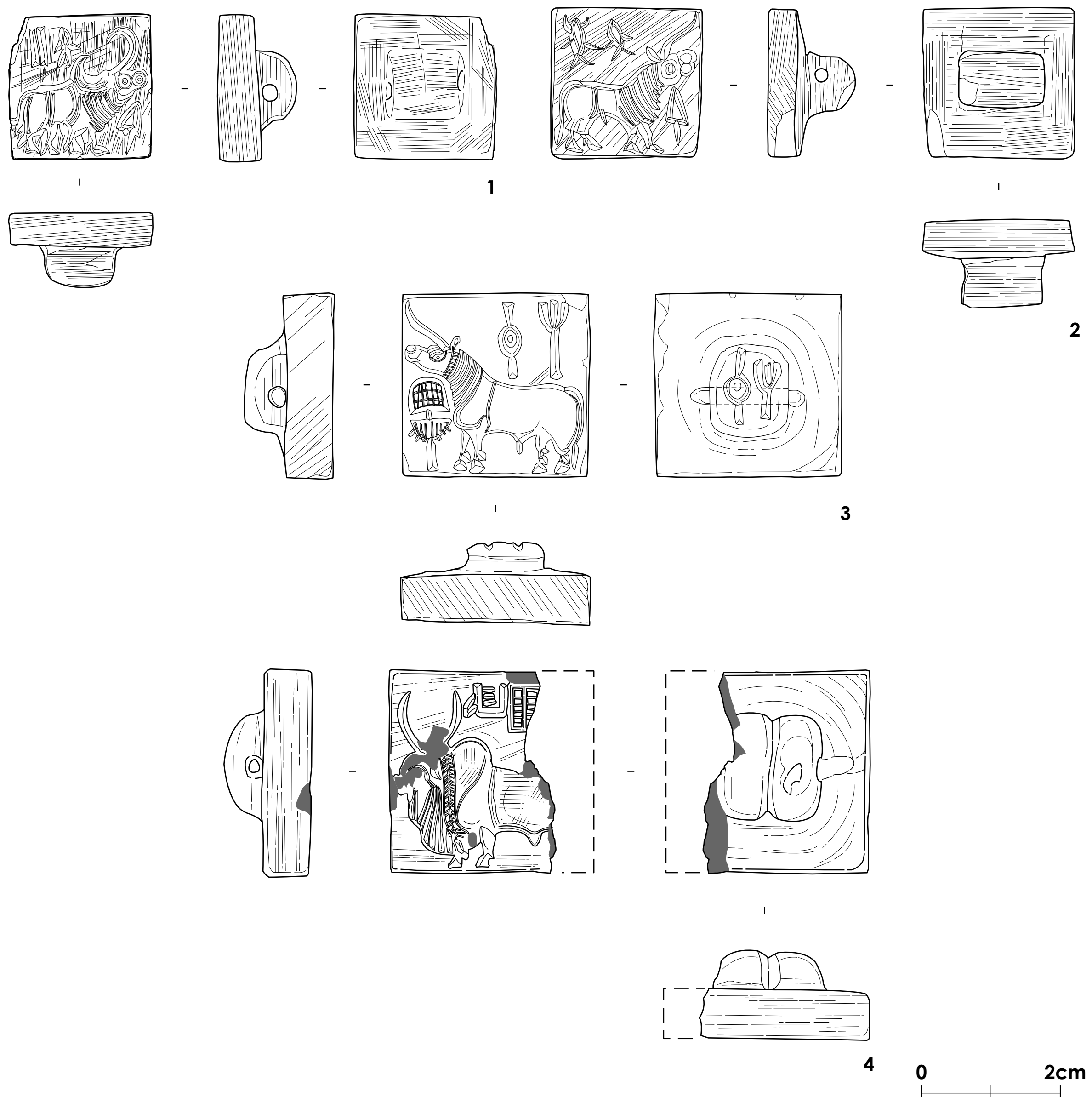


Figure 7.2 Steatite seal (1:1)

seals are all of square shapes with animal figures and Harappan signs on the obverse side, and knobs on the reverse side. Among terracotta objects with seal impressions, one specimen represents a sealing having impressions probably of reeds on the reverse side. On the obverse side is an impression of a square seal. Another specimen exhibits a circular plan with a lenticular section having a seal impression on the obverse side and a horizontal perforation on the back.

(Uesugi)

2.1 Steatite seals

(Figures 7.2, 7.4 - 7.15, Table 7.2)

Four steatite seals and two terracotta objects with seal impressions were unearthed in the excavations.

The seals are stylistically classified into two types based on the direction of the animals depicted in the seal.

Type 1 the animals depicted faces right.
Type 2 the animals depicted faces left.

Type 1 can be further characterized by an angular section and a semi-cylindrical knob. Deep striations

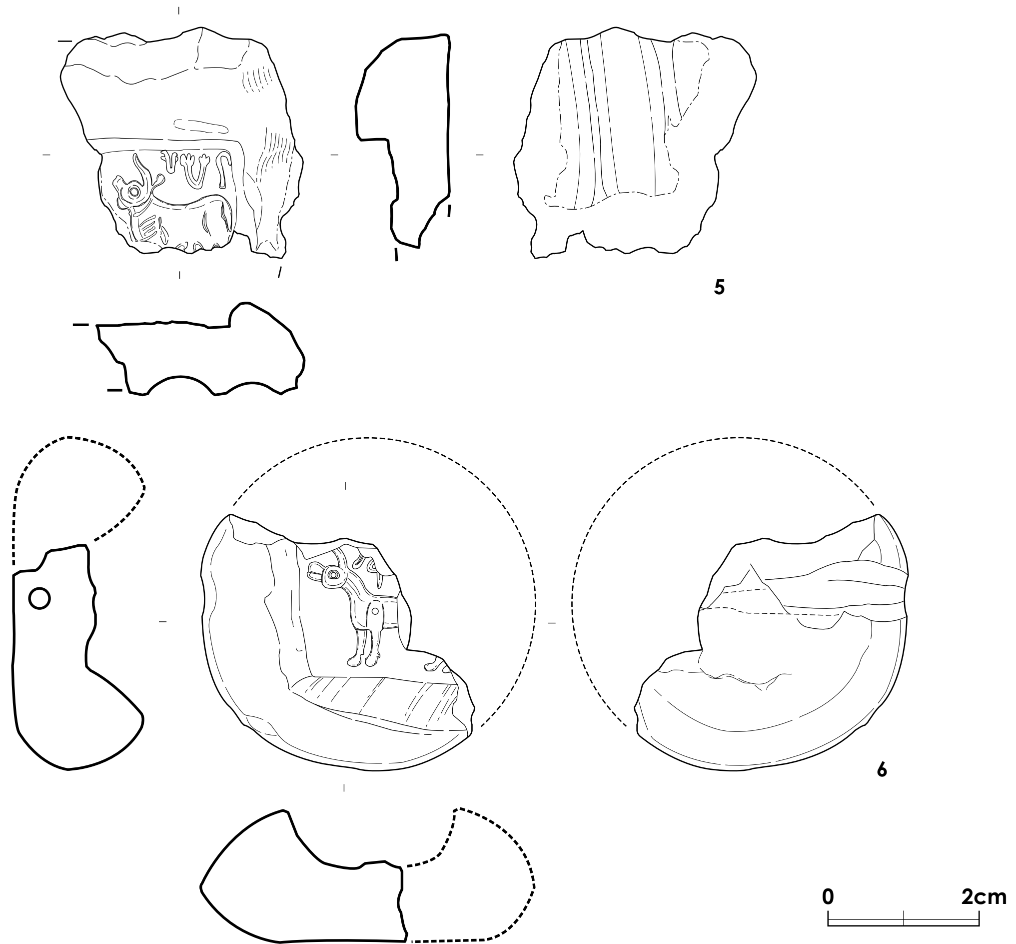


Figure 7.3 Terracotta objects with seal impressions (1:1)



Figure 7.4 Steatite seal and terracotta objects with seal impressions (1:1)



Figure 7.5 Steatite seal (×200%)



Figure 7.6 Steatite seal (×200%)



Figure 7.7 Steatite seal (×200%)



Figure 7.8 Steatite seal (×200%)

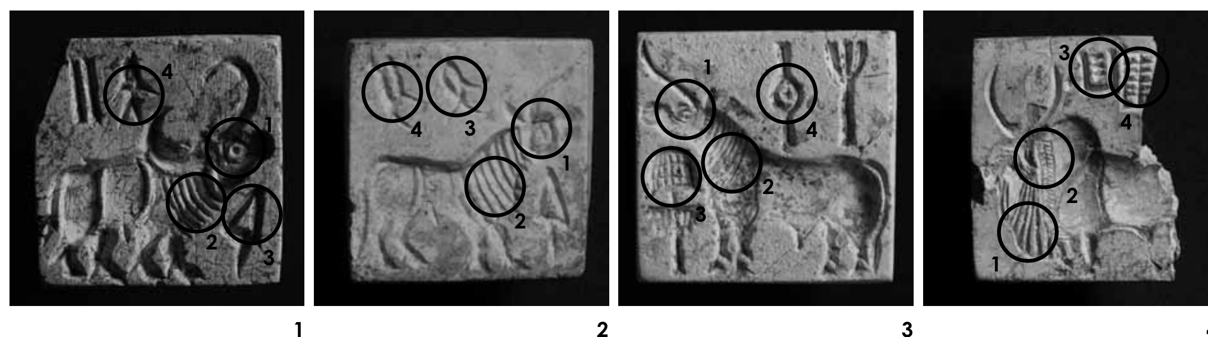


Figure 7.9 Portions indicated in SEM images of steatite seals

In S-1, four portions are observed by a SEM (Figures 7.10, 7.11) . The images of its concave eye exhibit very smooth surface in the centre and a relatively rough surface on its periphery, between which a sharp striation in a circle can be observed. It may suggest that the carving of the eye was done in two stages, may be by two types of tools, one of which has a pointed end with a rounded edge. In folds on the neck, angular strokes of carving are observed. Very sharp striations are found on their surface. In an arrow-shaped symbol in front of the buffalo, sharp strokes of carving in a V-shaped section can be observed. Sharp striations occur on the surface. The corner between two strokes exhibits a rounded surface in contrast with those of carved strokes. Also in a fish-shaped symbol, similar features of carved strokes and the corners are observable.

In S-2, four postions of the same area as those of S-1 are photographed by a SEM (Figure 7.12). A very smooth surface can be observed in its concave eye of an oblong shape. It seems likely that a instrument with an end different from that of S-1 in shape was used. In folds on the neck, the cross-sections shape of carving strokes are different from those of S-1 showing flat surfaces on the bottom (the top in the SEM image). This also shows a difference from S-1. In two fish-shaped symbols, similar striations can be observed on the surface of the carved strokes.

In S-3, four portions are selected for SEM images in the same way as S-1 and S-2 (Figure 7.13). The eye of this pecimen is different in shape from those of 06-110 and 08-500 showing an almond-shape. A very smooth surface of a circular shape is located in the centre between ridged outlines of the eye. It may suggest that the eye was made by carving of the outlines and excuting a dot in the centre by a pointed instrument. In folds on the neck, well-carved strokes in a V-shaped section are shown. In a symbol or a letter above the animal (indicated by 4 in a photo) consists of carved strokes and a dot in the centre. Sharp striations can be observed in the carved strokes and a very smooth surface occurs in the centre of the dot.

In S-4, four areas are chosen for SEM images (Figure 7.14). Unfortunately, the eye portion is damaged, so it cannot provide a chance of comparison of the eye with those of other specimens. In folds on the neck, rough surfaces are be observed in the bottom of the carved strokes (that is, the top of ridges on the SEM image), while the surface of the sides of carved strokes are smooth. In a garland, the SEM images give obscure pictures due to the a number of cavities in the impression, although striations are shown in carved strokes. In two symbols of letters, very sharp images are exhibited. In both, the carved strokes indicate fine skills of carving showing a V-shaped section with sharp edges. The corner between strokes are also sharp in contrast with those in S-1.

(Uesugi)

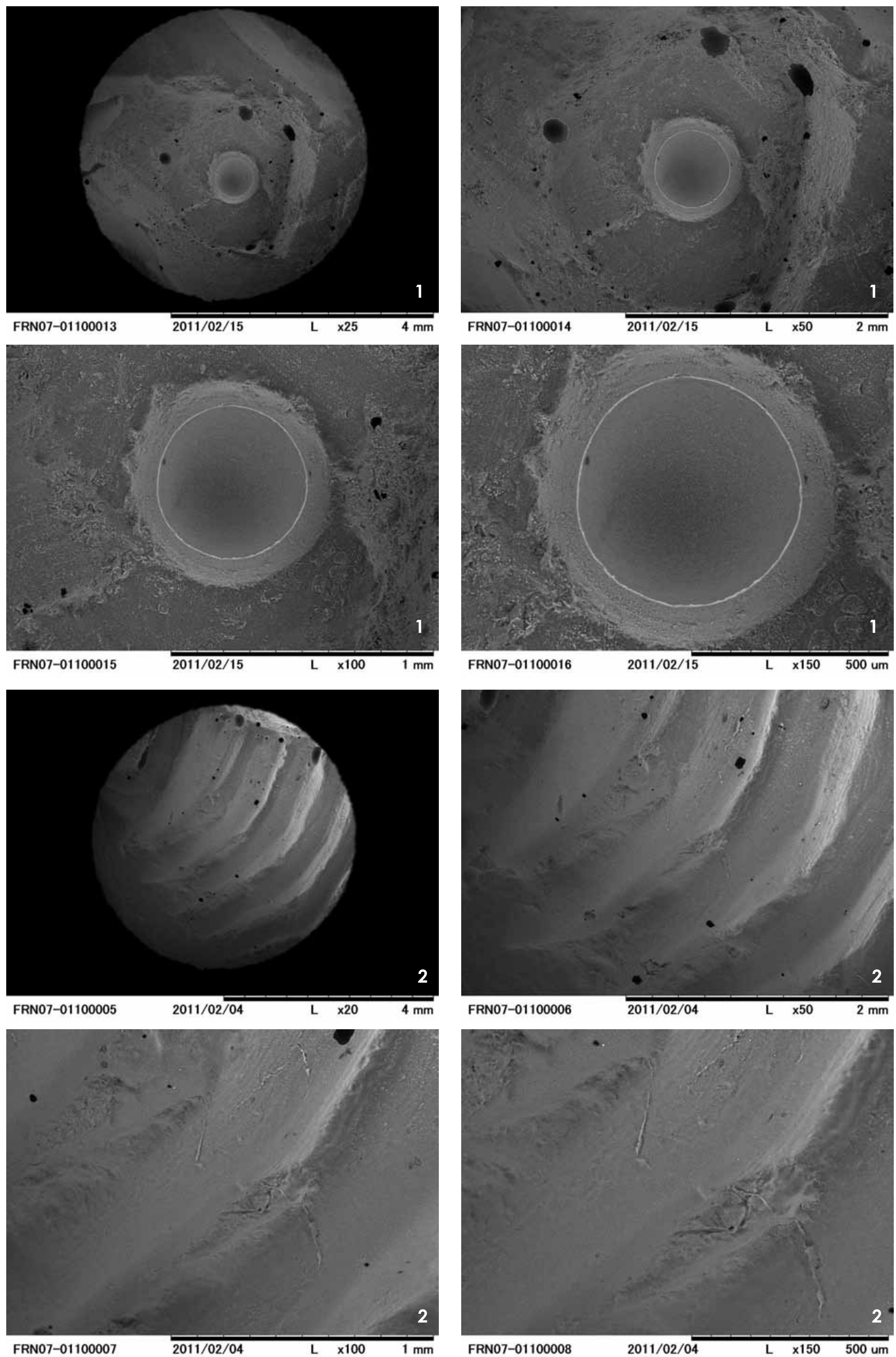


Figure 7.10 SEM image of steatite seal (S-1)

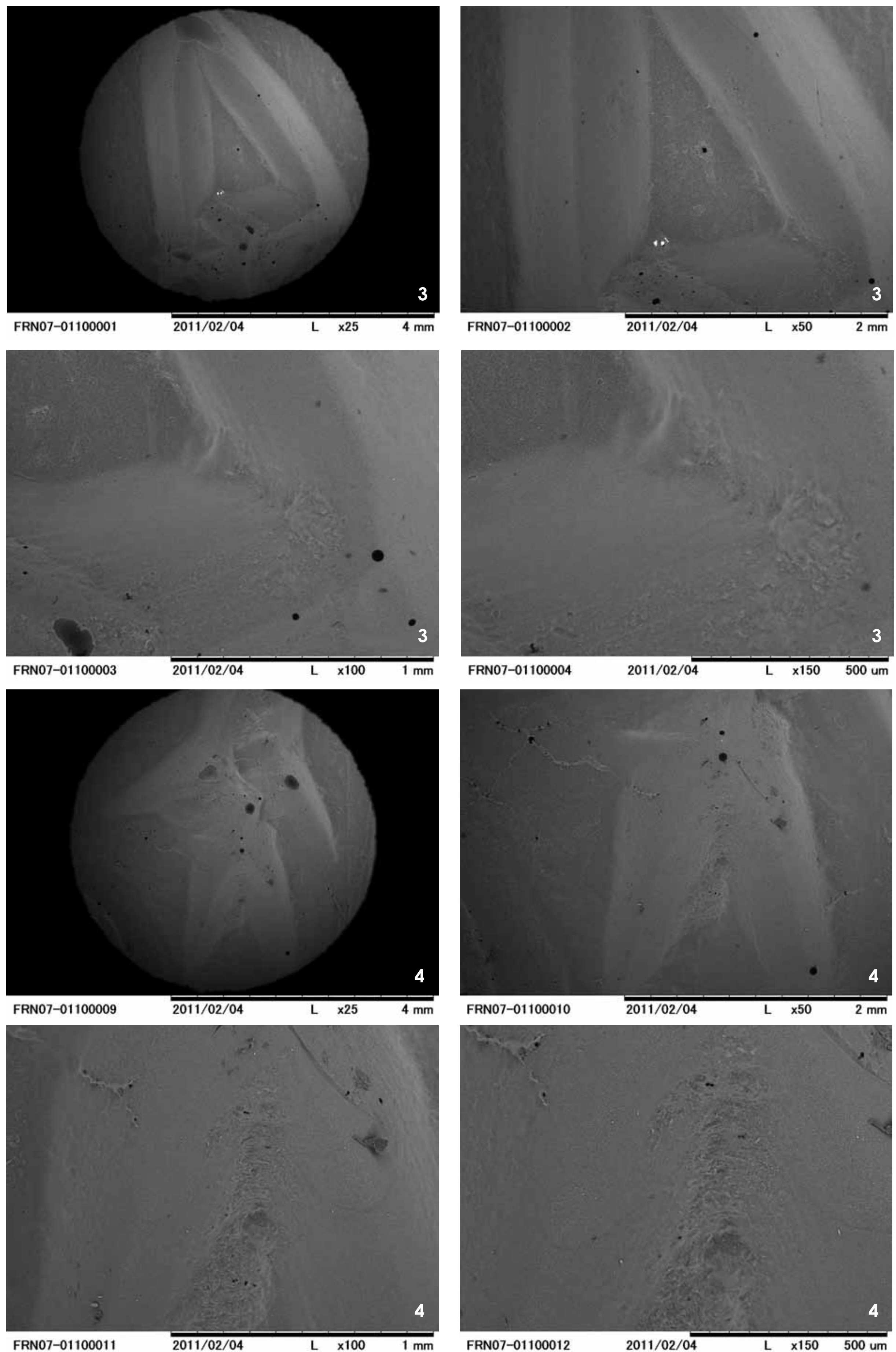


Figure 7.11 SEM image of steatite seal (S-1)

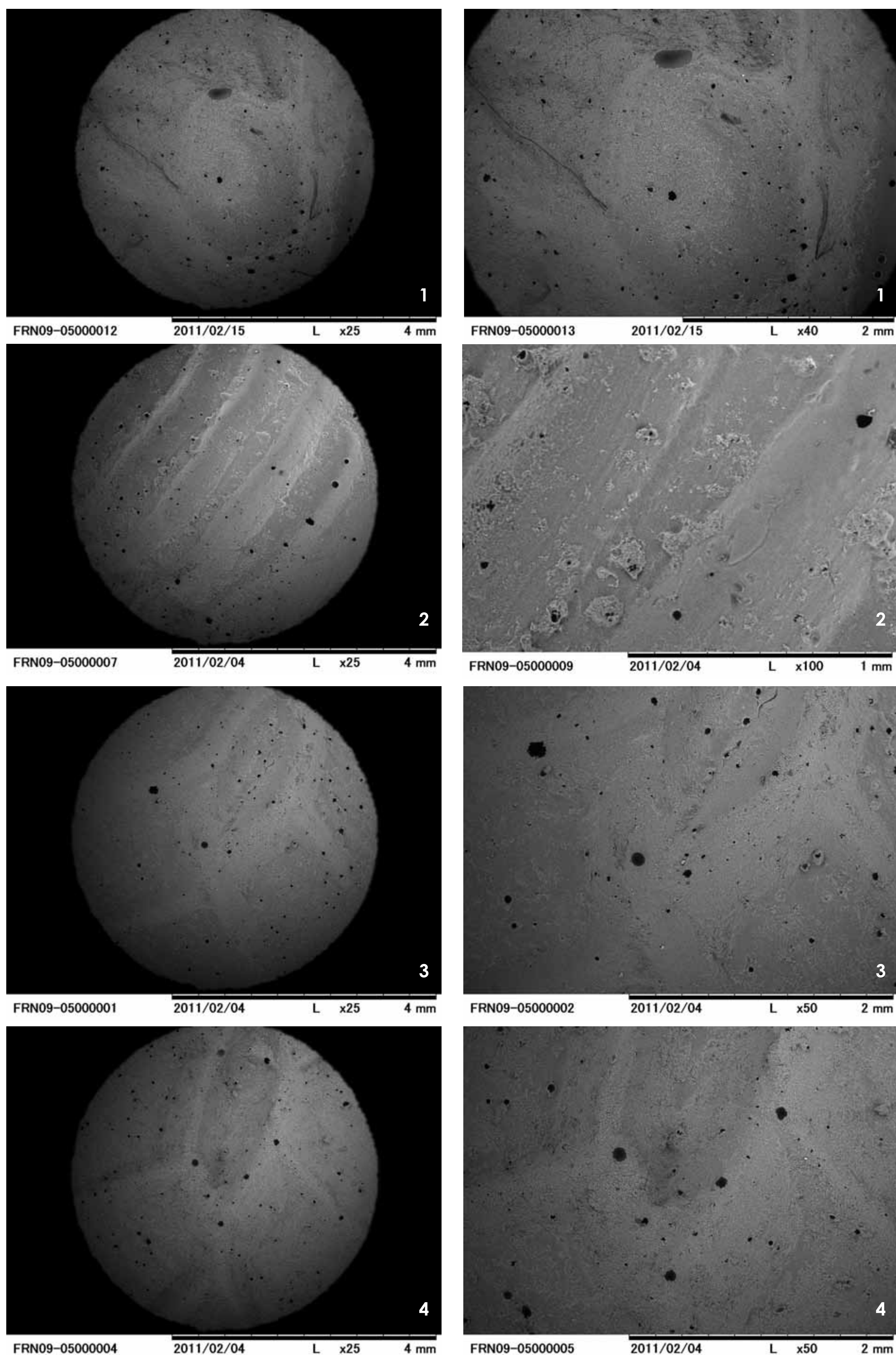


Figure 7.12 SEM image of steatite seal (S-2)

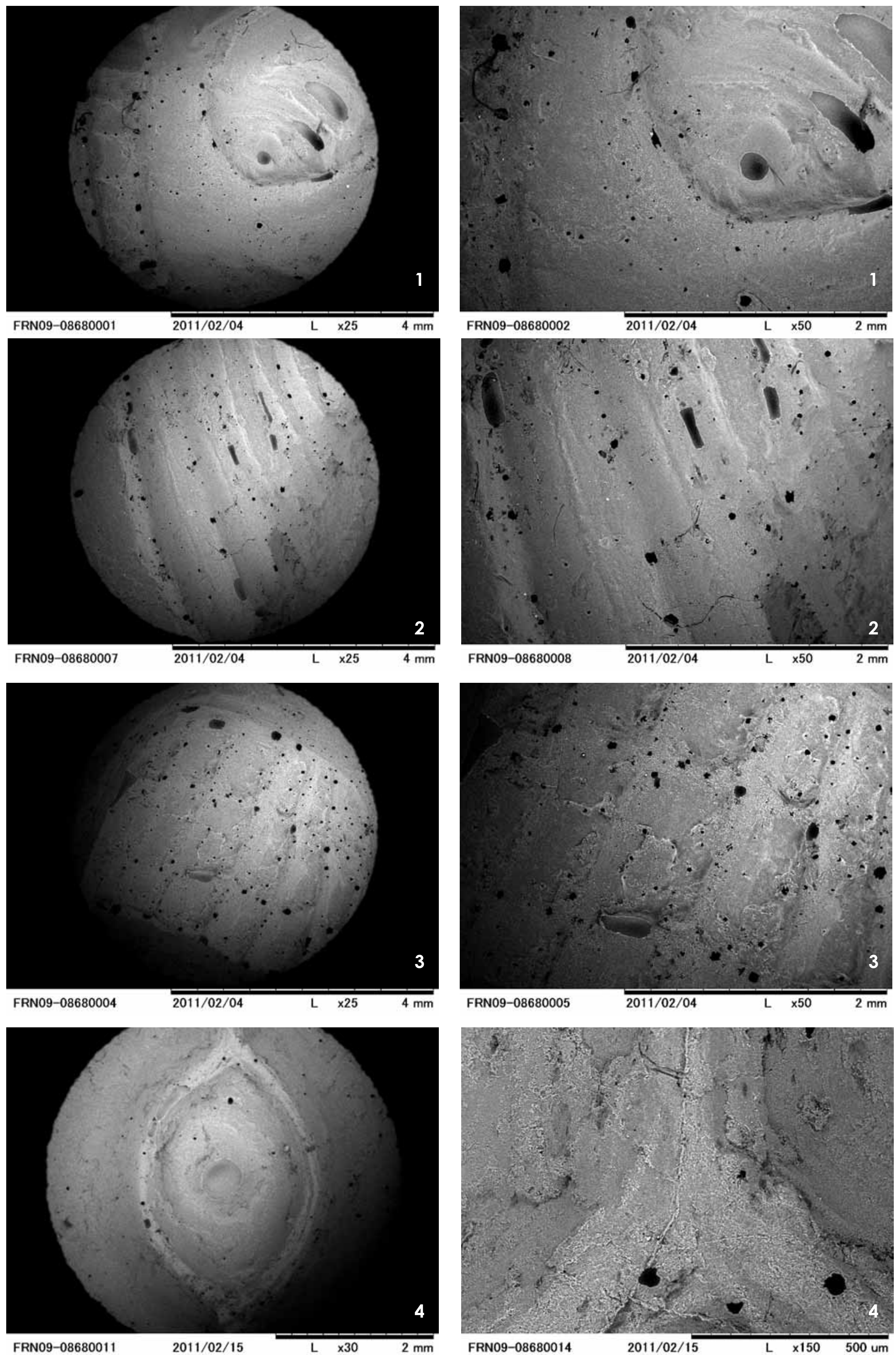


Figure 7.13 SEM image of steatite seal (S-3)

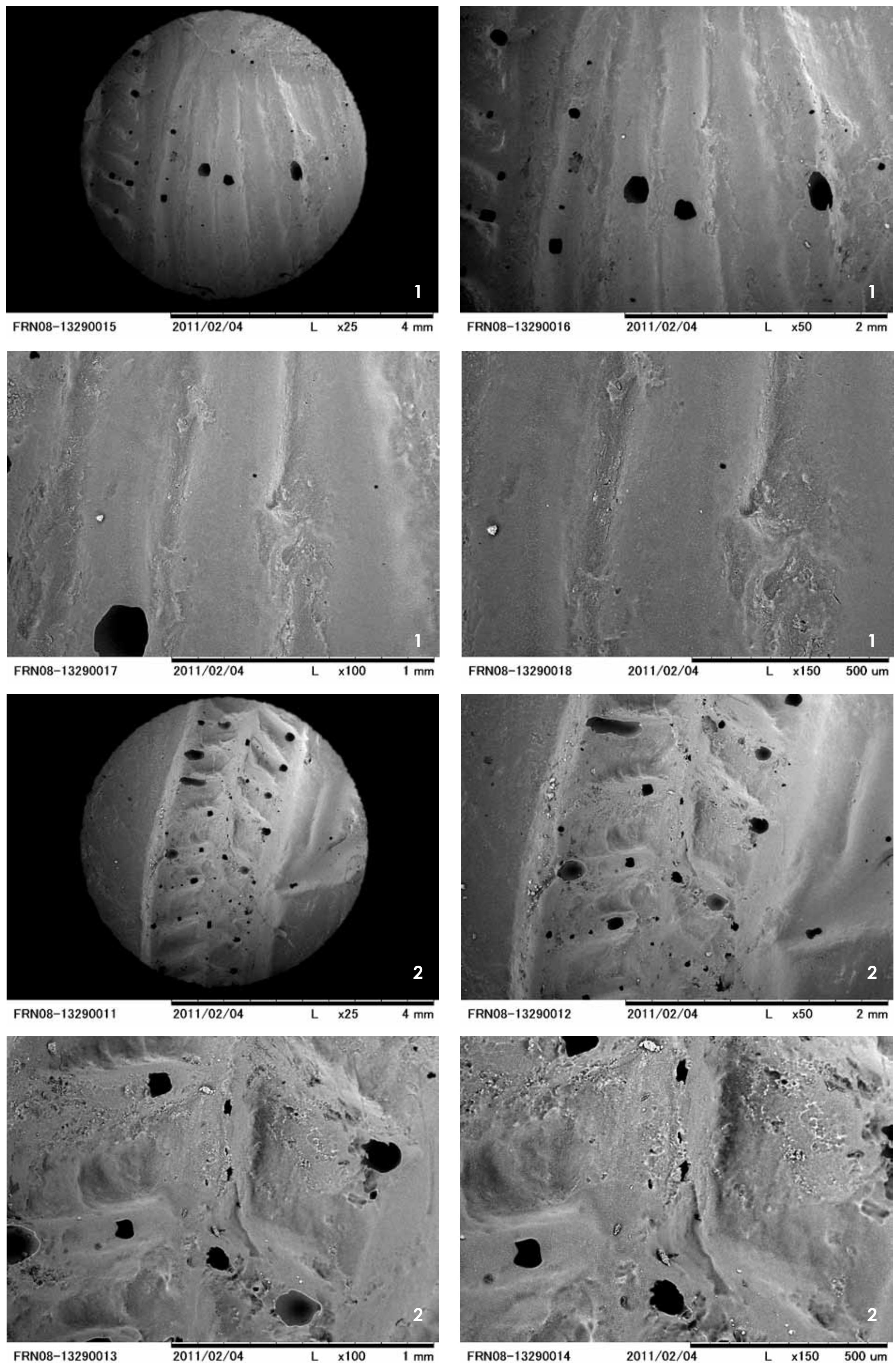


Figure 7.14 SEM image of steatite seal (S-4)

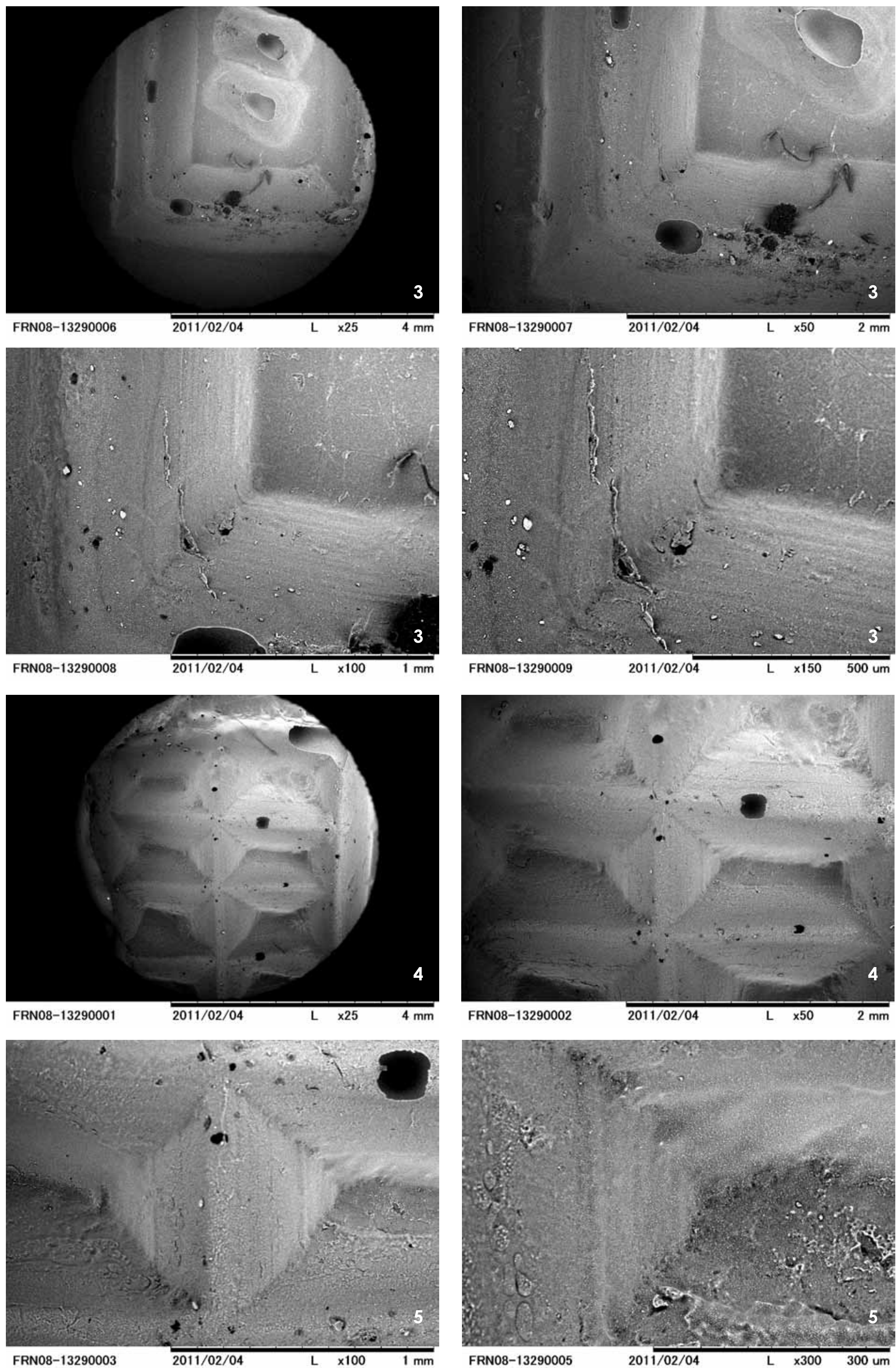


Figure 7.15 SEM image of steatite seal (S-4)







Figure 7.16 Terracotta sealing (×200%)





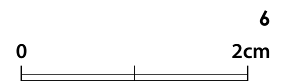


Figure 7.17 Terracotta object with a seal impression (ca. ×150%)

which are associated with cutting and grinding are prominently left on all surfaces. The animals depicted are respectively a buffalo (S-1) and an unicorn (S-2). In both specimens two Harappan signs are engraved above the animals. A fish-like sign is included in both cases. Both also have an arrowhead-like sign in front of the animals. S-1 measures 20.65 mm by 20.13 mm in plan and 11.0 mm in thickness, and no. 2 measures 21.02 cm by 21.32 cm in plan and 12.36 mm in thickness. The weights are 5.25 g and 5.98 g respectively.

Type 2 is characterized by animals facing left. The depicted animals are a unicorn and a humped bull in each case. In contrast to Type 1, the section of engraved animals is round and the surface are conspicuously smoother. S-3 has two signs on the

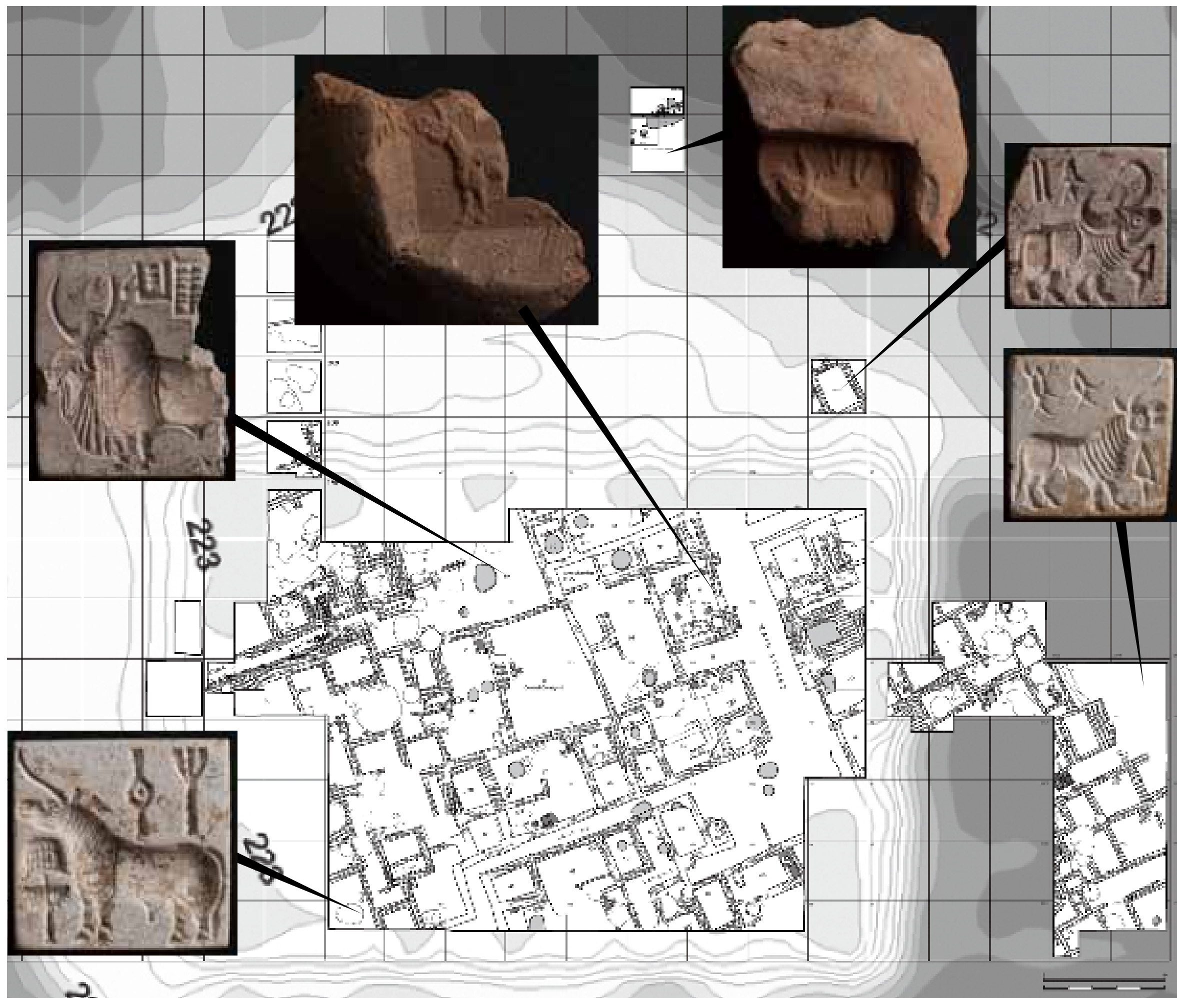


Figure 7.18 Findspots of seals and objects with seal impressions

upper side of the unicorn and a sacrificial stand in the front of the animal. In case of S-4, more than two signs were carved on the upper side of the humped bull. There is no object in front of the animal. Two Harappan signs, the same as those on the obverse, are engraved on the top of the rounded-rectangular knob of S-3. S-4 has a double boss. Type 2 is larger than Type 1, measuring 26.97 mm by 27.36 mm in S-3 and 29.74 mm by more than 24.82 mm in S-4.

Figure 7.18 shows the distribution of the seals. S-1 was excavated in association with Structure no. 1 in Trench 2, which belonged to Structural Phase 4. S-2 was found in a layer which sealed the mud-brick structures of Structural Phase 4 in Trench 2XD of the east excavation area. S-3 was excavated in a layer enclosing the mud-brick structures of Structural Phase 5 in Trench 1H8 of the central excavation area. S-4 was unearthed in a layer sealing mud-brick structures of Structural Phase 5 in Trench 1B6 of the central excavation area. While non of the seals were found in specific contexts which would allow us to determine their association with any structures, their stratigraphic positions are nonetheless indicative. Type 1 may be associated with Structural Phase 4 whereas Type 2 can be associated with Structural Phase 5.

(Uesugi/Konasukawa)

2.2 Objects with seal impressions

(Figures 7.3, 7.4, 7.16, 7.17, Table 7.3)

Two terracotta objects with seal impressions were unearthed in the excavation. One is identified

as a fired clay sealing with a seal impression, and the second as a kind of pendant as it has a well-modelled circular shape and a perforation through the object.

The terracotta sealing (S-5), which is partially intact, has a seal impression on the obverse side and grooves which seems to be made by the impression of bamboo-like materials on the reverse side. The edge of the clay lump is not well-modelled. It has finger impressions intact on the surface. Impressions of cloth are visible on the surface of the obverse side. In the rectangular depression which is made by the impression of a seal, part of unicorn facing left and three Harappan signs are embossed. On the seal itself, the unicorn would have faced right like the Type 1 of the steatite seals discussed above. This object was excavated in Trench 3.

A pendant-like object with a seal impression (S-6) is only partially intact, but it was certainly circular in shape and plano-convex in section. The object is perforated horizontally, and was probably meant to be hung from a thread. The rectangular depression made by seal on the obverse side has a partially preserved unicorn. The animal faces left in this specimen as well, showing that the original seal had a unicorn facing right.

(Uesugi/Konasukawa)

3 TERRACOTTA OBJECTS

3.1 Outlines

(Table 7.4)

In total, 11677 specimens of terracotta artefacts were found in the excavations. Most of them are represented by fragments of terracotta bangles. Beads, balls, animal figurines follow it though they are much less in number than bangles.

As is the case of pottery and other minor objects, terracotta objects includes Historical ones as well as the Harappan ones. However, in some objects, it is difficult to determine their period as they represent very simple and common shapes. In addition, that most of them were found in the uppermost levels close to the surface makes it difficult to distinguish Harappan objects and Historical objects stratigraphically.

(Uesugi)

3.1 Human figurines

(Figures 7.19, 7.20)

Two terracotta human figurines were found in the excavations (T-1, T-2). Both specimens can be considered as belonging to the Historical period.

T-1 is distinguished by a simple formal features which show a head, arms and legs all pinched out from a clay lump. A navel is indicated by an incised dot. It measures 2.8 cm in intact height, 1.6 cm in intact width and 0.6 cm in thickness. It was found in a Phase 5 context in the Central Area. This type of human figurines has been frequently reported from Historical sites in North India, especially of Kushana and Gupta periods.

Another specimen of human figurine (T-2) has a part of a head of a female holding a baby in her arms. . The head of a baby is also intact. The female has eyes, nose and a mouth on her face and a knot on the top of her head. She also wears a pair of ear rings. The figurine is moulded from a single mould. It measures 42.6 cm in intact height, 39.6 cm in intact width and 19.0 cm in thickness. It was found in Phase 5, in the Central Area. This type of moulded figurines has been widely reported from North Indian sites, especially of the Gupta period. (Uesugi)

3.2 Animal figurines

(Figures 7.21 - 7.42, Table 7.5, 7.6)

Sixty-six specimens of animal figurines, including possible fragments, were found in the excavations. They include not only Harappan specimens but also

Table 7.4 Formal variety of terracotta objects

Variety of terracotta objects	Total
Object with a seal impression	1
Clay lump with a seal impression	1
Human figurines	2
Animal figurines	66
Wheels	38
Cart-frames	63
Bangles	11160
Beads	149
Cakes	49
Balls	76
Discs	23
Miniature vessels	3
Pyramidal objects	6
Stopper-like objects	14
Drum-shaped objects	5
Unidentified objects	21
Total	11677

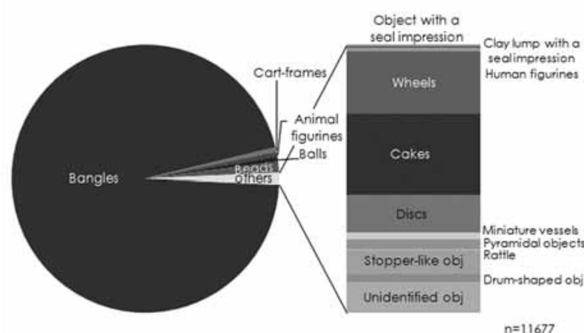


Table 7.5 Area-wise stratigraphic distribution of Harappan terracotta animal figurines

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	1	0	0	0	0	0	0	0	1
Phase 5	26	26	0	0	0	0	0	0	0
Phase 4	15	1	8	0	0	2	4	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	1	0	0	0	1	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	1	0	0	0	1	0	0	0	0
Total	44	27	8	0	2	2	4	0	1

Table 7.6 Area-wise stratigraphic distribution of Gupta terracotta animal figurines

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	1	0	0	0	0	0	0	0	1
Phase 5	10	10	0	0	0	0	0	0	0
Phase 4	1	0	0	0	0	1	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	1	0	0	0	1	0	0	0	0
Total	13	10	0	0	1	1	0	0	1

Mauryan and Gupta period figurines. Those which are considered as Harappan are distinguished by their hand-modelling technique, whereas those of the Gupta period are exclusively made by double moulds. One specimen of the Mauryan period shows a distinctive decoration which is made by appliqué and stamp technique.

Harappan animal figurine

Forty-four Harappan period specimens were identified, although some examples with only a torso or hind legs may belong to the Historical period. They are exclusively modelled by hand.

23 specimens can be identified as humped bulls as they have horns and humps. Two specimens may be regarded as bulls with no hump. One specimen may

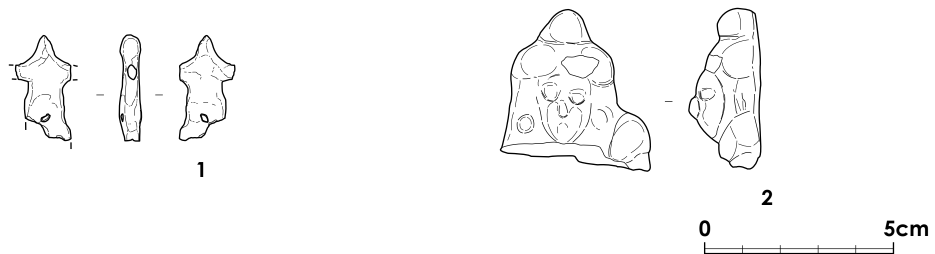


Figure 7.19 Terracotta Human figurines (1:2)



Figure 7.20 Terracotta Human figurines (1:1)

represent a sheep and another specimen may indicate a dog. Three specimens are identifiable as birds.

Among the 23 specimens of humped bulls, 18 specimens are distinguished by simple formal features which consist of legs, a pair of horns, a hump and a tail (T-4 - T-14, T-18, T-19). Five other specimens (T-3, T-15 - T-17, T-20) show a pair of eyes made by incision. Of these, one specimen has a pair of eyes made by appliqué circlets and incised dots and a pair of projecting ears executed with short grooves (T-20). It is difficult to measure the entire size as there are no complete specimens, but the length from the tip of nose to the tail can be measured in seven specimens, and shows a range of 5.1 - 8.9 cm. T-17 may have been larger than the others as it measures 6.9 cm in intact length though it is only the forepart of the animal. Its original length may have been around 13.0 cm.

The bull figurines (T-21) are identified as having no hump and they have a pair of horns. The length from the tip of the nose to the tail is 6.3 cm.

Only the forepart of a specimen (T-23) identified as a sheep is intact. It has a horizontal perforation through the lower part of the body instead of legs. This indicates that a wooden rod was inserted in the perforation and was fixed with wheels. Although the horns are missing, enough is left to see that they curled backwards, suggesting that this piece may be a sheep or mouflon. The figurine measures 7.2 cm in intact length, and was originally probably around 10 cm in length.

One specimen (T-22) is identified as a dog based on the absence of horns and a hump. It measures 4.2 cm in length, smaller than humped bull figurines.

Three specimens of birds (T-24, T-25) all have a low pedestal below their body, most probably for making them stand by their own. They measure 4.4 cm to 7.1 cm in length.

In terms of provenance, 33 of the specimens were found in the Central Area (one from Phase 4 and 32 specimens from Phase 5), nine specimens come from the East Area (Phase 4), five specimens from the North Area (Phase 4), two specimens from the

Northwest Area (Phase 2), two specimens from the North Extension (Phase 4) and one specimen from the surface (Table 7.15).

Mauryan animal figurine

One specimen collected from the surface (T-26) can be assigned to the Mauryan-Sunga period based on its stylistic features. It represents an elephant. It is modelled by hand and decorated with appliqué, stamped and incised dots, and grooves. The eyes are lozenge-shaped. It measures 11.0 cm in intact length, suggesting an original length of around 14.0 cm.

This type of animal figurines, which is distinguished by its lozenge-shaped eyes, appliqué decoration and stamp technique has often been reported from North Indian sites of the Mauryan-Sunga periods. Although there are no other objects which can be assigned to the Mauryan-Sunga periods, this piece of animal figurine indicates that the site was inhabited during these periods as well.

Gupta animal figurine

Those figurines identified as belonging to the Gupta period are exclusively modelled in double moulds. There are two types of representation, i.e. those representing only an animal and those representing an animal figurine with a rider.

Animal figurine	8
Animal figurine with a rider	4
Unidentified	1

Among those representing only an animal, six of the figurines are bulls, onemay be a tortoise or a frog and one is an uncertain animal.

Two types are distinguished in the representations of bull figurines. One (three specimens) depicts a crouching bull (T-27 - T-29) and another (three specimens) exhibits a standing bull (T-30, T-31).

The crouching bull figurines have a flat bottom surface so that they can stand by their own. The legs, short horns, eyes and ears are indicated. In addition to physical features, the presence of beaded necklace is also distinctive. They are modelled in double moulds and the join of the moulds which forms a central line through the body is trimmed in order to erase any irregularities. The figurines measure around 4.0 cm in length, 4.5 cm in height and 1.9 - 2.3 cm in width. This type of moulded figurine of crouching animals has been reported several North Indian sites.

The figurines representing standing bulls are distinguished by a hump and measure 7.6 - 8.65 cm in length, larger than the crouching bulls. They have realistic representations of short horns, but are missing ears and eyes. Shallow parallel ridges are made on the front part of the body. In T-30, spiral motifs are expressed on either side of the hump.

One specimen of a tortoise or a frog (T-36) is distinguished by simple features which consist of hemispherical body, a pair of eyes fashioned by appliqué circlets and dots, a nostrils indicated by incised dots and a mouth indicated by a horizontal groove. On the upper surface of the body there are traces of appliqué bands which have been detached.

Figurines of animals with riders are represented by four specimens (T-32 - T-35), all of which are modelled in double moulds. In one specimen only a rider is preserved, but other three specimens depict a rider sitting on the back of an animal. The animals represented are an elephant in one example and a horse in two others. The riders have a knot on the top of their heads, and eyes and a nose on their faces. In the case of horse figurines, bridles are indicated by shallow raised bands. These figurines measure 5.95 cm to 6.55 cm in length, 8.0 cm in height and 2.95 cm to 3.45 cm in width.

In terms of provenance, 10 of these Gupta period animal figurines were found in the Central Area, one was recovered in the Northwest Area, and one in the North Extension (Table 7.6). They were all found in the uppermost levels close to the surface.

(Uesugi)

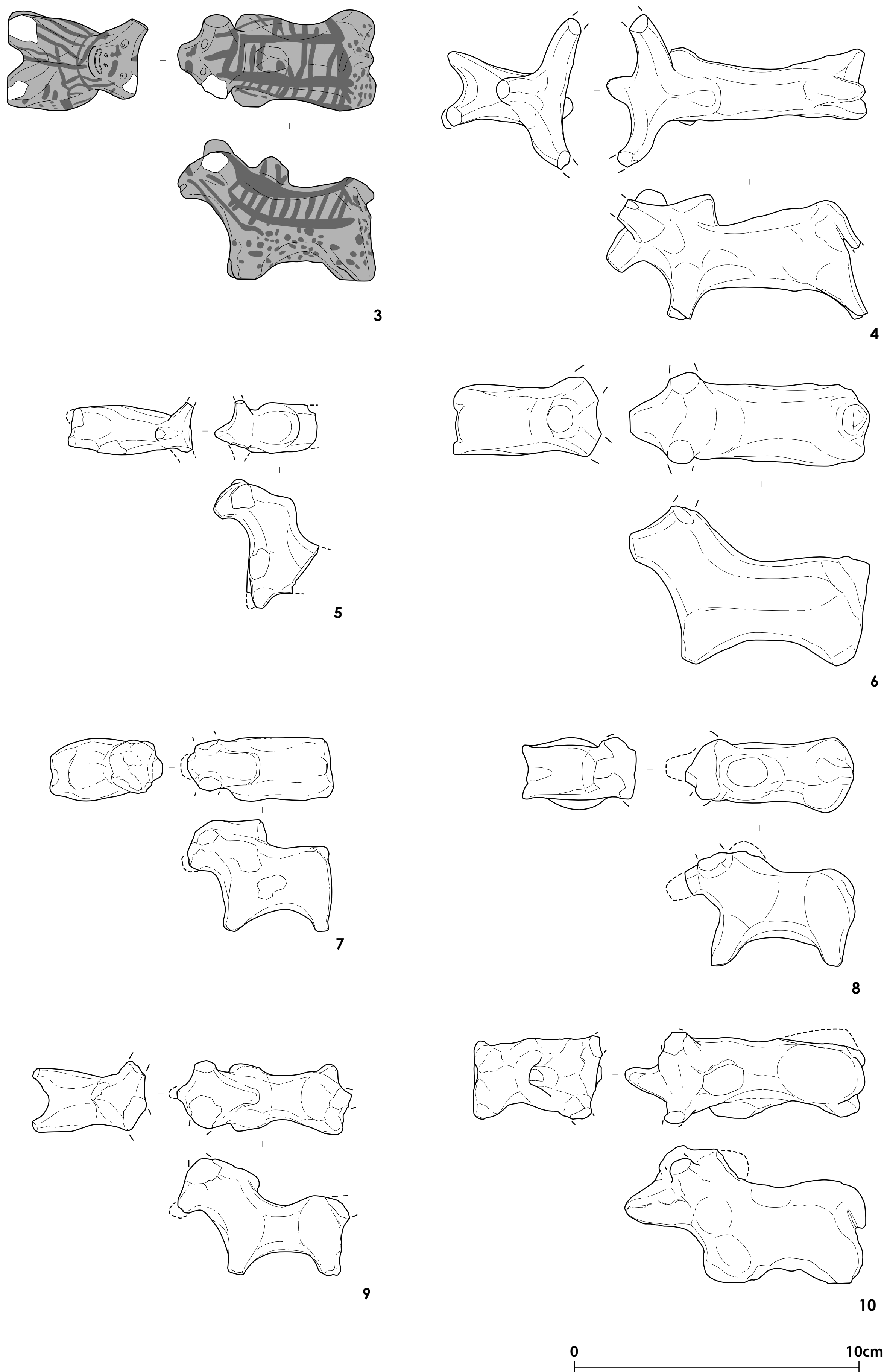


Figure 7.21 Terracotta animal figurines (1:2)

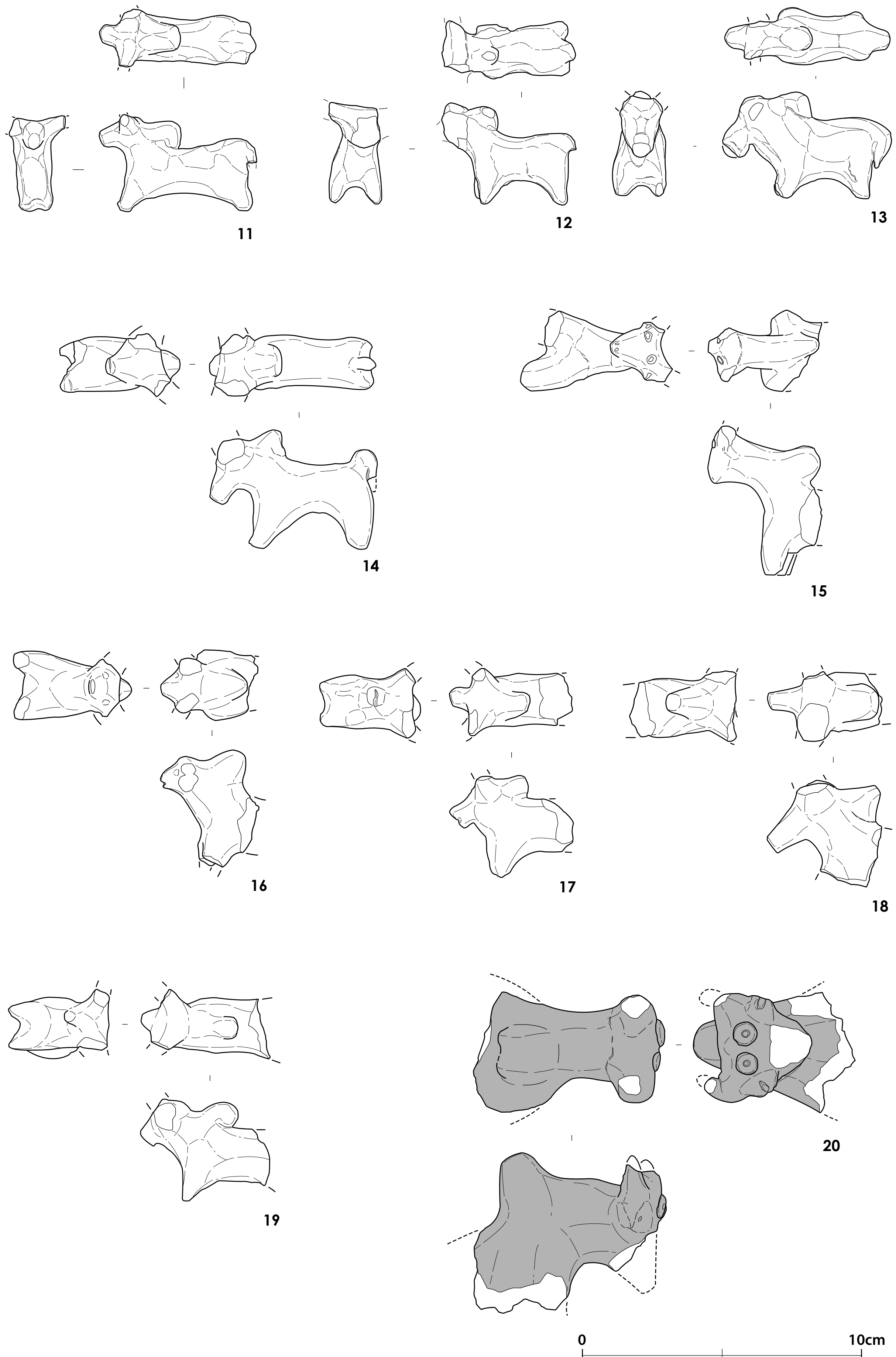


Figure 7.22 Terracotta animal figurines (1:2)

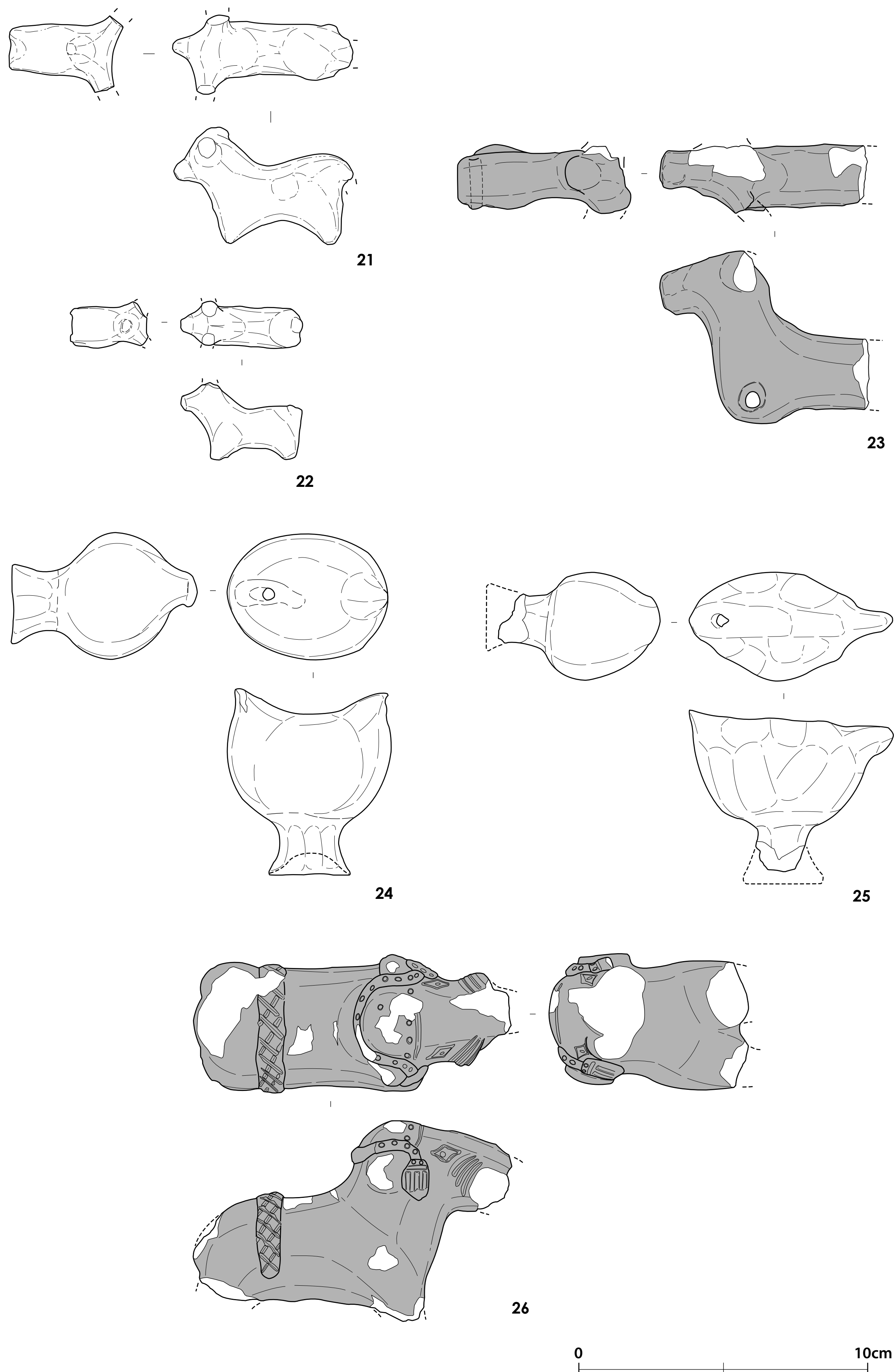


Figure 7.23 Terracotta animal figurines (1:2)

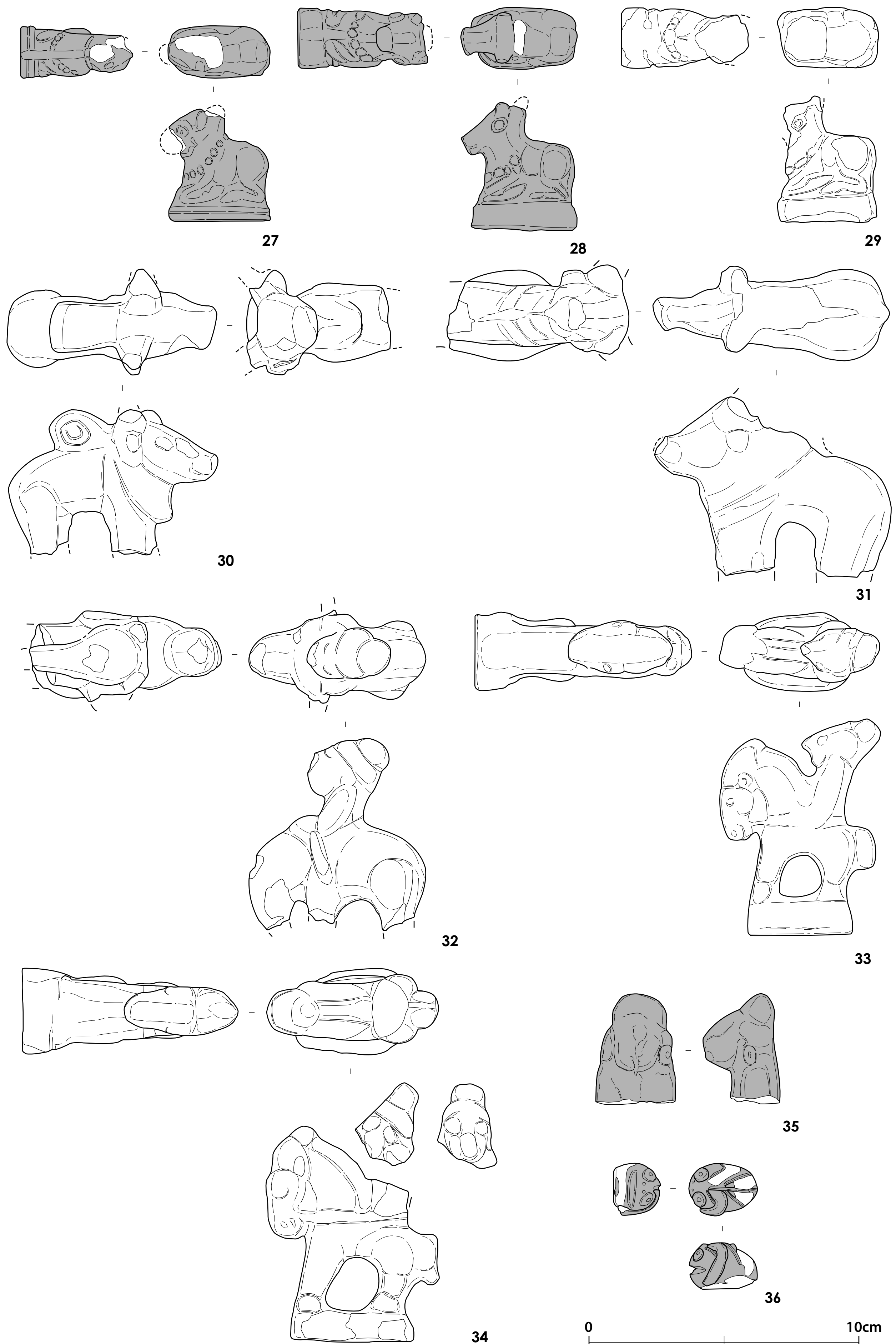


Figure 7.24 Terracotta animal figurines (1:2)

3

0 5cm

Figure 7.25 Terracotta animal figurine (1:1)



Figure 7.26 Terracotta animal figurine (1:1)



Figure 7.27　Terracotta animal figurines (1:1)



Figure 7.28　Terracotta animal figurines (1:1)



Figure 7.29 Terracotta animal figurines (1:1)



Figure 7.30 Terracotta animal figurines (1:1)



Figure 7.31 Terracotta animal figurines (1:1)



Figure 7.32 Terracotta animal figurines (1:1)



Figure 7.33 Terracotta animal figurine (1:1)



Figure 7.34 Terracotta animal figurines (1:1)



Figure 7.35 Terracotta animal figurine (1:1)



Figure 7.36 Terracotta animal figurine (1:1)



Figure 7.37 Terracotta animal figurines (1:1)



Figure 7.38 Terracotta animal figurine (1:1)



Figure 7.39 Terracotta animal figurine (1:1)





Figure 7.40 Terracotta animal figurines (1:1)



Figure 7.41 Terracotta animal figurines (1:1)



Figure 7.42 Terracotta animal figurine (2:1)

3.3 Cart-frames

(Figures 7.43 - 7.50, Table 7.7)

Sixty-three pieces of cart-frames were found in the excavations. They can be roughly classified into chassis and a part connecting the chassis and wooden parts.

The part connecting the chassis and wooden parts is represented by nine specimens (T-40 - T-48). They measure 2.6 cm to 4.0 cm in width, 1.3 cm to 2.0 cm in height and 0.8 cm to 19.0 cm in thickness. Two specimens (T-40, T-41) have two horizontal perforations and one vertical perforation, while seven specimens (T-42 - T-48) are perforated with only horizontal holes.

The chassis can be further classified into two types, i.e. a solid type and a hollow type. The solid type is distinguished by a flat rectangular body with rounded edges. The four corners are pierced by one vertical hole each and two vertical holes are placed near the edge of both the longer sides. Also on one shorter side there is one unpierced horizontal perforation. Four examples were found in the excavations (T-49 - T-51). Among them, two specimens (T-49, T-50) are almost complete, measuring 5.0 cm to 7.6 cm in length, 3.0 cm to 5.2 cm in width and 11.0 cm to 12.0 cm in thickness. One broken specimen (T-51) may have a length of 6.5 cm. The width is 4.1 cm and the thickness 1.1 cm.

The other type of hollow chassis is distinguished by projecting ends and rectangular hollows on the body (T-52 - T-61). Every piece has vertical and horizontal perforations, though no complete examples were found. One specimen (T-52) is painted in black.

The cart-frames were found mostly in the Central Area (51 specimens) and in limited numbers in the East, Northwest and North Areas (Table 7.7). In the Central Area, they come primarily from Phase 5, but there are a few specimens from Phases 1, 2 and 4. The examples from the East Area are from Phase 4, three specimens from Phase 2 and one from a dump in the Northwest Area. Those from the North Area date to Phase 4.

(Konasukawa/Uesugi)

3.4 Wheels

(Figures 7.51 - 7.57, Table 7.8, 7.9)

Thirty-eight specimens of terracotta wheels were found in the excavations. They are characterized by a disc-shaped body with a short truncated conical hub in the centre of one side. They measure 2.7 cm to 8.6 cm in diameter and 1.1 cm to 3.8 cm in thickness (Table 7.9).

23 examples of wheels were found in the Central Area, two in the East Area, seven in the Northwest Area, one in the North Extension and four more in the North Area (Table 7.8). Those from the Central Area occur in Phases 1 (one specimen) and 5 (22 specimens). Those from the East Area belong to Phase 4, while three specimens from the Northwest Area were found in Phase 2 (three specimens) and in

Table 7.7 Area-wise stratigraphic distribution of terracotta cart-frames

	Total	***Central Area***	***East Area***	***West Area***	***Northwest Area***	***North Extension***	***North Area***	***Kiln Area***	***Surface***
Surface	3	0	0	0	0	0	0	0	3
Phase 5	46	46	0	0	0	0	0	0	0
Phase 4	7	2	2	0	0	0	3	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	4	1	0	0	3	0	0	0	0
Phase 1	1	1	0	0	0	0	0	0	0
Uncertain	2	1	0	0	1	0	0	0	0
Total	63	51	2	0	4	0	3	0	3

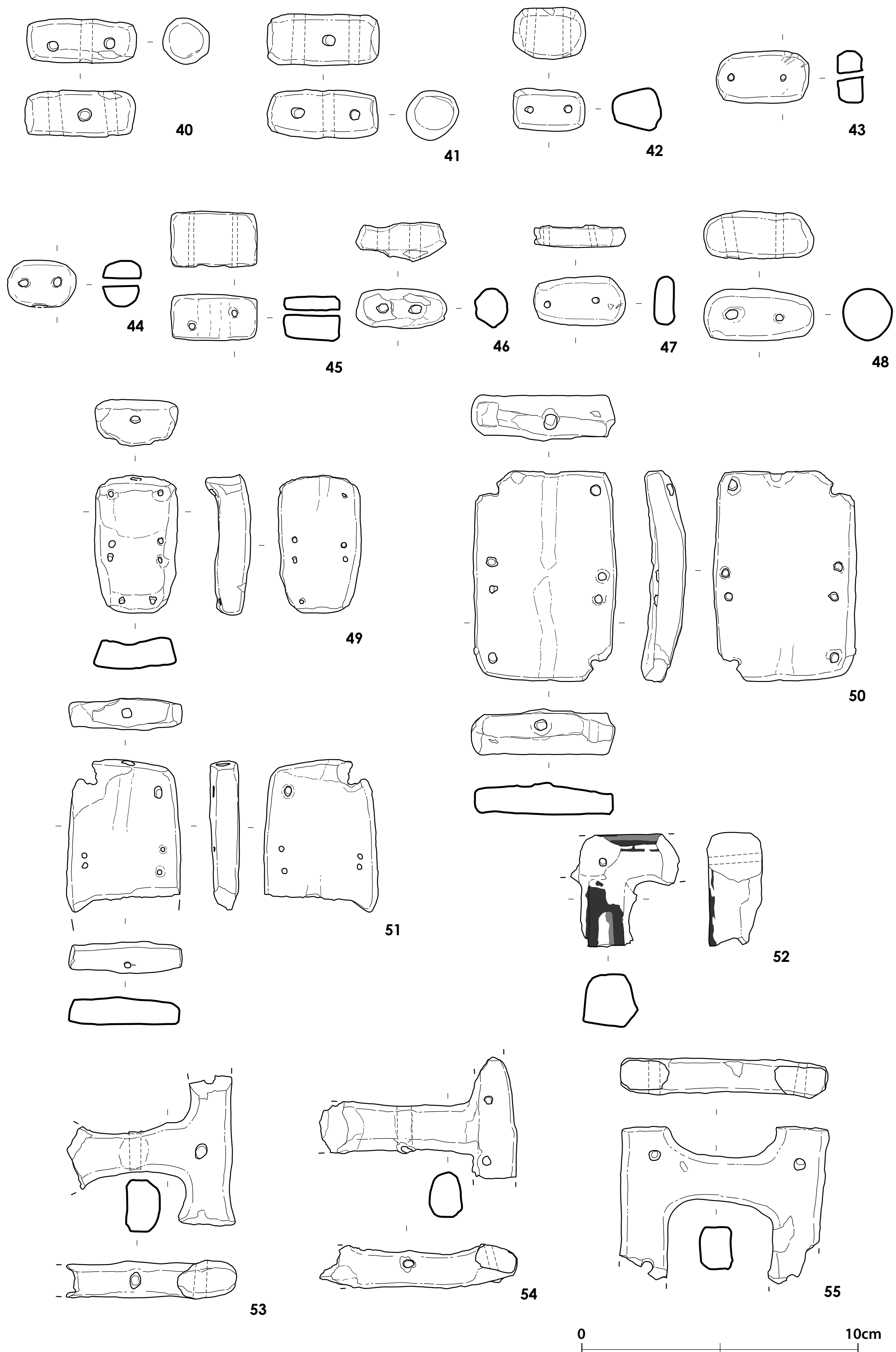


Figure 7.43 Terracotta cart-frames (1:2)

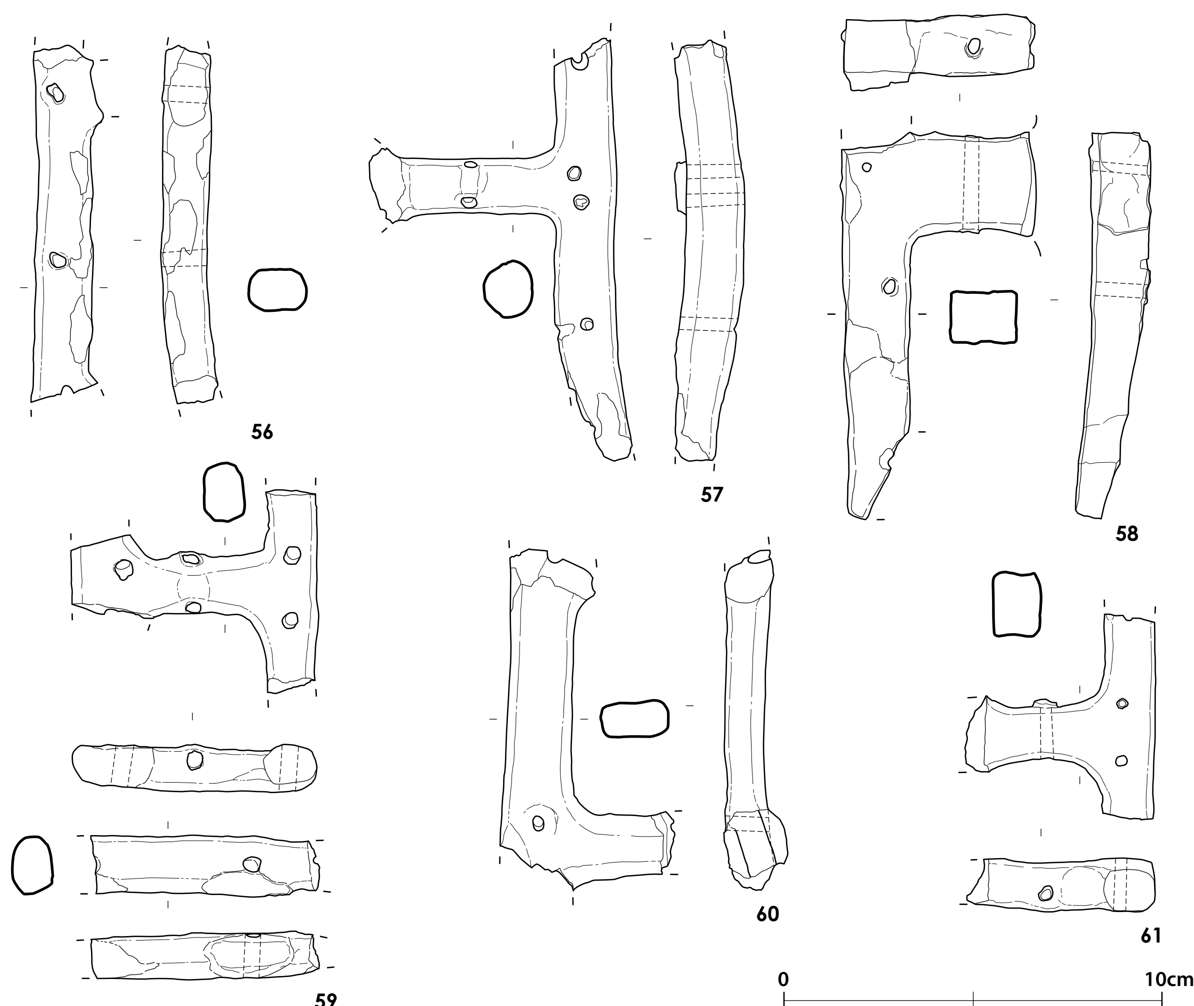


Figure 7.44 Terracotta cart-frames (1:2)

a dump (four specimens). The wheels found in the North Extension date to Phase 3, and those in the North Area to Phase 4.

(Konasukawa/Uesugi)

3.6 Bangles

(Figure 7.58 - 7.62, Table 7.10, 7.11)

In total, 11160 fragments of terracotta bangles were found in the excavations. No complete specimens were identified, suggesting that most of them were highly fragmented after their being discarded and by the deposition of successive floors and layers.

Most of them are distinguished by a very simple form with no decoration, but some specimens are executed by black painting (T-99 - T-102, T-128 - T-135), a whitish slip (T-92, T-96) or with incised dots (T-127). Some specimens are modelled from multiple strands (T-103 - T-108, T-121). In most cases they are round in section.

The number of 835 specimens of the better preserved specimens were chosen for measurements. They measure 3.6 cm to 9.4 cm in the external diameter. They are shown in Table 7.11 divided into 1 cm classes. This table indicates that the bangles ranging from 4.1 cm to 8.0 cm in diameter are dominant.

In terms of provenance, most came from Phase 5 of the Central Area, followed by Phase 4 of the East Area, Phase 4 of the North Area and Phase 2 of the Northwest area (Table 7.10). In the Central Area they also occur in Phases 1 to 4.

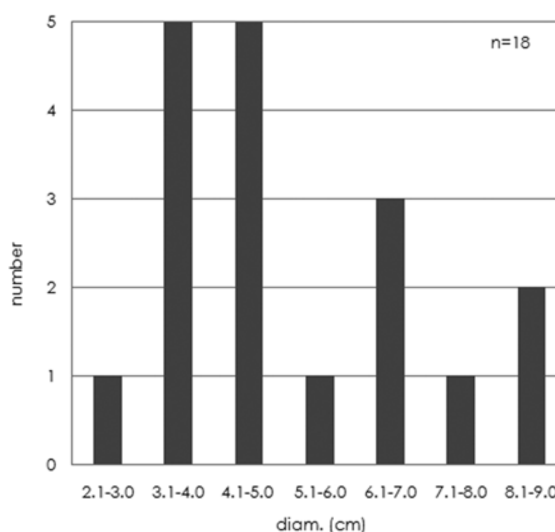
(Konasukawa/Uesugi)

Table 7.8 Area-wise stratigraphic distribution of terracotta wheels

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	2	0	0	0	0	0	0	0	2
Phase 5	21	21	0	0	0	0	0	0	0
Phase 4	6	0	2	0	0	0	4	0	0
Phase 3	2	1	0	0	0	1	0	0	0
Phase 2	3	0	0	0	3	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	4	0	0	0	4	0	0	0	0
Total	38	22	2	0	7	1	4	0	2

Table 7.9 Size distribution of terracotta wheels

External diam.	no.
2.1-3.0	1
3.1-4.0	5
4.1-5.0	5
5.1-6.0	1
6.1-7.0	3
7.1-8.0	1
8.1-9.0	2



3.7 Beads

(Figure 7.63 - 7.71)

149 examples of terracotta beads were unearthed in the excavations. They can be classified into the following types based on their shapes.

Type 1	Long barrel
Type 2	Tubular
Type 3	Biconical
Type 4	Arecanut-shaped
Type 5	Flat biconical
Type 6	Ring-shaped
Type 7	Globular
Type 8	Short cylindrical

[Type 1]

Only three specimens of this type were found in the excavations (T-136 - T-138) . These measure 4.2 mm to 9.75 mm in diameter and 9.6 mm to 15.1 mm in height. One specimen (not illustrated) is executed with a slip which shows banded colours.

Both specimens were found in Phase 5 contexts in the Central Area.

[Type 2]

Type 2 is represented by 48 specimens (T-139 - T-151). Only three specimens are complete. These measure 25.0 mm to 85.0 mm in height. The diameter of all the specimens ranges from 5.0 mm to 12.0 mm. In general the modelling is crude.

43 specimens come from the Central Area (four from Phase 2, one from Phase 4 and 38 from to Phase 5), three come from the East Area (Phase 4), and two from the North Area (Phase 4).

[Type 3]

Type 3 is represented by 30 specimens which



Figure 7.45 Terracotta cart-frames (1:1)



Figure 7.46 Terracotta cart-frame (1:1)



Figure 7.47 Terracotta cart-frames (1:1)



Figure 7.48 Terracotta cart-frames (1:1)



Figure 7.49 Terracotta cart-frame (1:1)



Figure 7.50 Terracotta cart-frames (1:1)

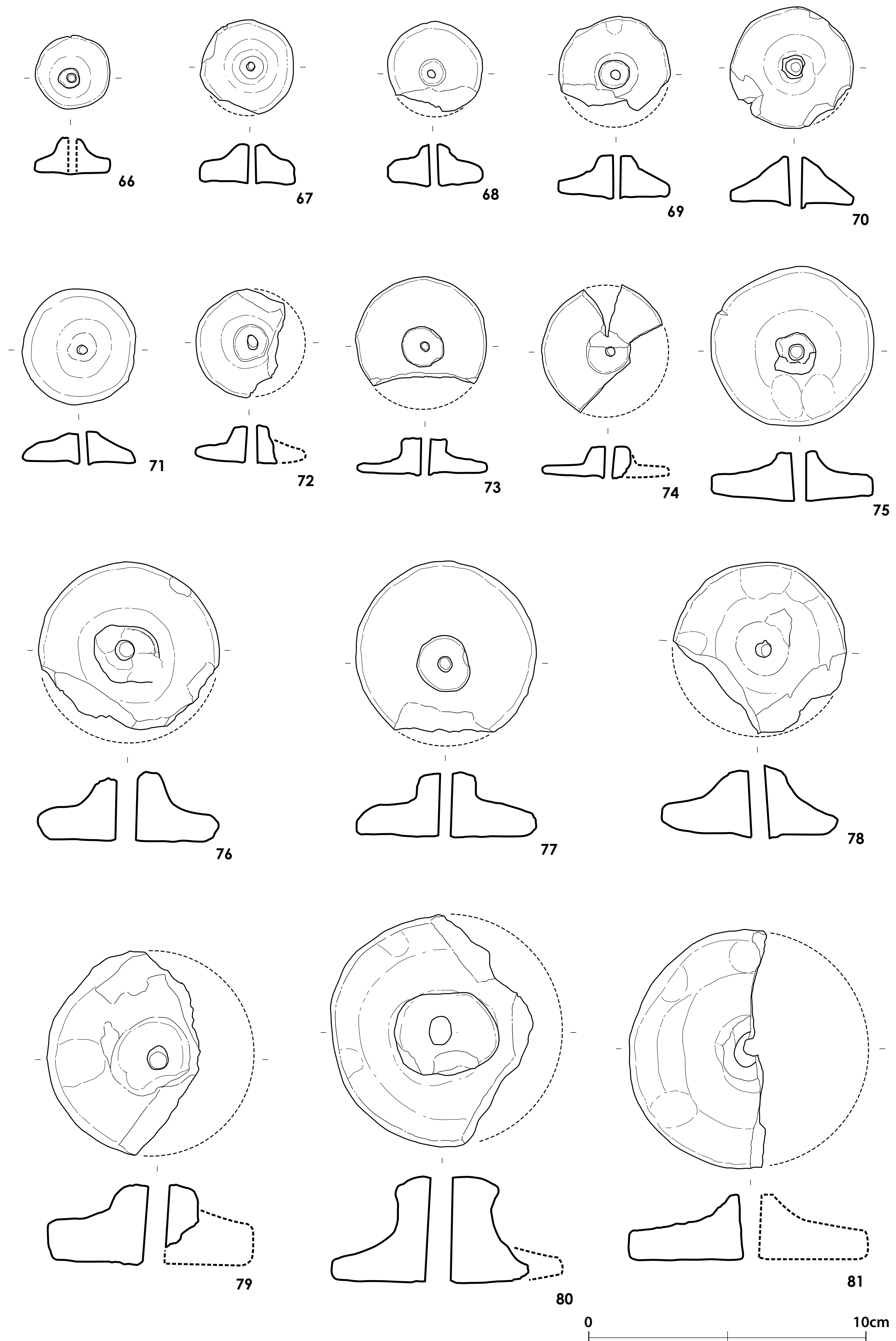


Figure 7.51 Terracotta wheels (1:2)



Figure 7.52 Terracotta wheels (1:1)



Figure 7.53 Terracotta wheels (1:1)



Figure 7.54 Terracotta wheels (1:1)



Figure 7.55 Terracotta wheels (1:1)



Figure 7.56 Terracotta wheel (1:1)



Figure 7.57 Terracotta wheel (1:1)

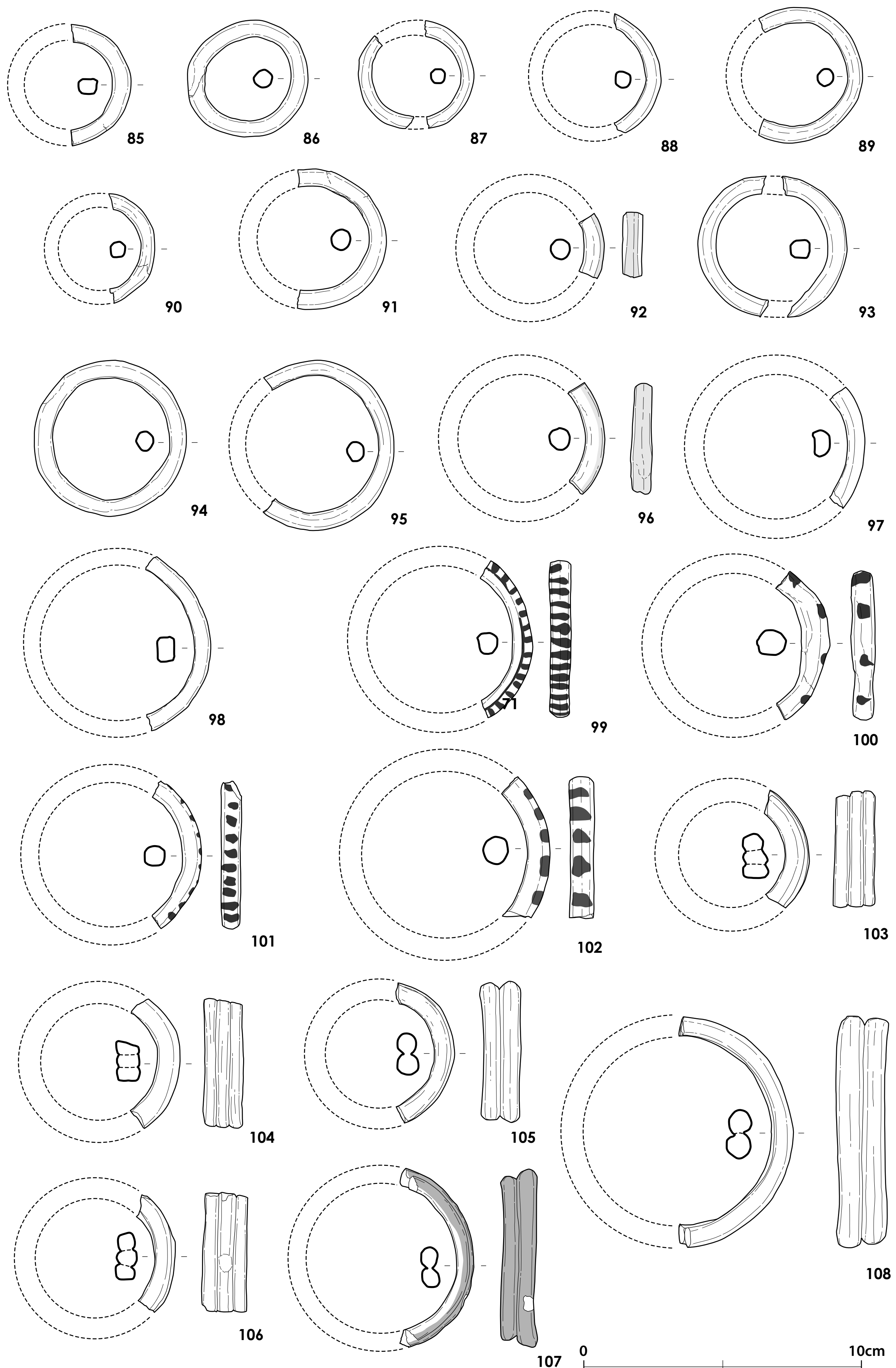


Figure 7.58 Terracotta bangles (1:2)



Figure 7.59 Terracotta bangles (1:1)



Figure 7.60 Terracotta bangles (1:1)



Figure 7.61 Terracotta bangles (1:1)



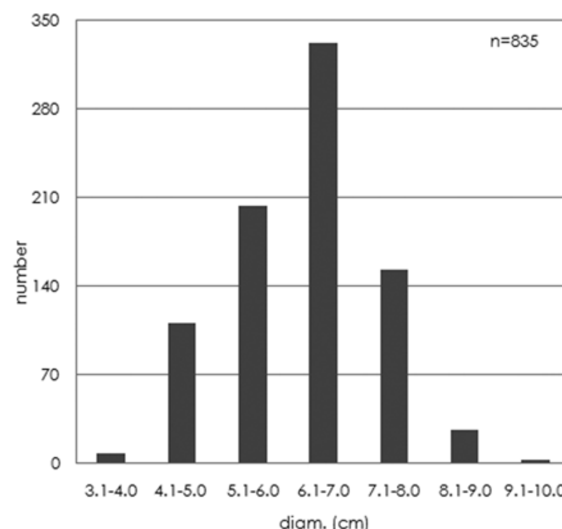
Figure 7.62 Terracotta bangles (1:1)

Table 7.10 Area-wise stratigraphic distribution of terracotta bangles

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	8	0	0	0	0	0	0	0	8
Phase 5	9229	9229	0	0	0	0	0	0	0
Phase 4	1232	81	762	0	0	71	318	0	0
Phase 3	144	24	0	0	0	56	64	0	0
Phase 2	213	21	0	0	172	20	0	0	0
Phase 1	55	32	0	0	16	7	0	0	0
Uncertain	279	3	0	56	220	0	0	0	0
Total	11160	9390	762	56	408	154	382	0	8

Table 7.11 Size distribution of terrcotta bangles

External diam.	no.
3.1-4.0 cm	8
4.1-5.0 cm	111
5.1-6.0 cm	203
6.1-7.0 cm	332
7.1-8.0 cm	153
8.1-9.0 cm	26
9.1-10.0 cm	2



show a wide variety in size, from 4.6 mm to 45.0 mm in diameter and 3.4 mm to 42.0 mm in height (T-152 - T-180). One specimen (T-179) is decorated with black paintings and four specimens (T-169, T-170, T-177, T-178) with incised decorations.

24 specimens come from Phase 5 of the Central Area, and five from the North Extension (two from Phase 3 and three from Phase 4).

[Type 4]

Thirteen specimens belong to Type 4 (T-181 - T-188). They measure 22.7 mm to 31.5 mm in diameter and 16.0 mm to 24.8 mm in height. They are considered to belong to the Historical period.

Eleven specimens come from Phase 5 of the Central Area, and two specimens from Phase 4 of the North Extension.

[Type 5]

Type 5 is represented by only four specimens (T-189 - T-192). They measure 12.0 mm to 19.5 mm in width, 5.5 mm to 10.5 mm in thickness and 12.0 mm to 16.5 mm in height.

Three specimens come from Phase 5 of the Central Area and one from Phase 4 of the East Area.

[Type 6]

Thirty-nine specimens of Type 6 were found in the excavations (T193 - T-208). Only 10 specimens are complete measuring 21.0 mm to 39.0 mm in diameter and 8.0 mm to 16.0 mm in height. There are two types of profile, i.e. flat cylindrical and flat biconical.

25 specimens belong to Phase 5 of the Central Area, four to the East Area (Phase 4), seven to the Northwest Area (one to Phase 2 and six to a dump),

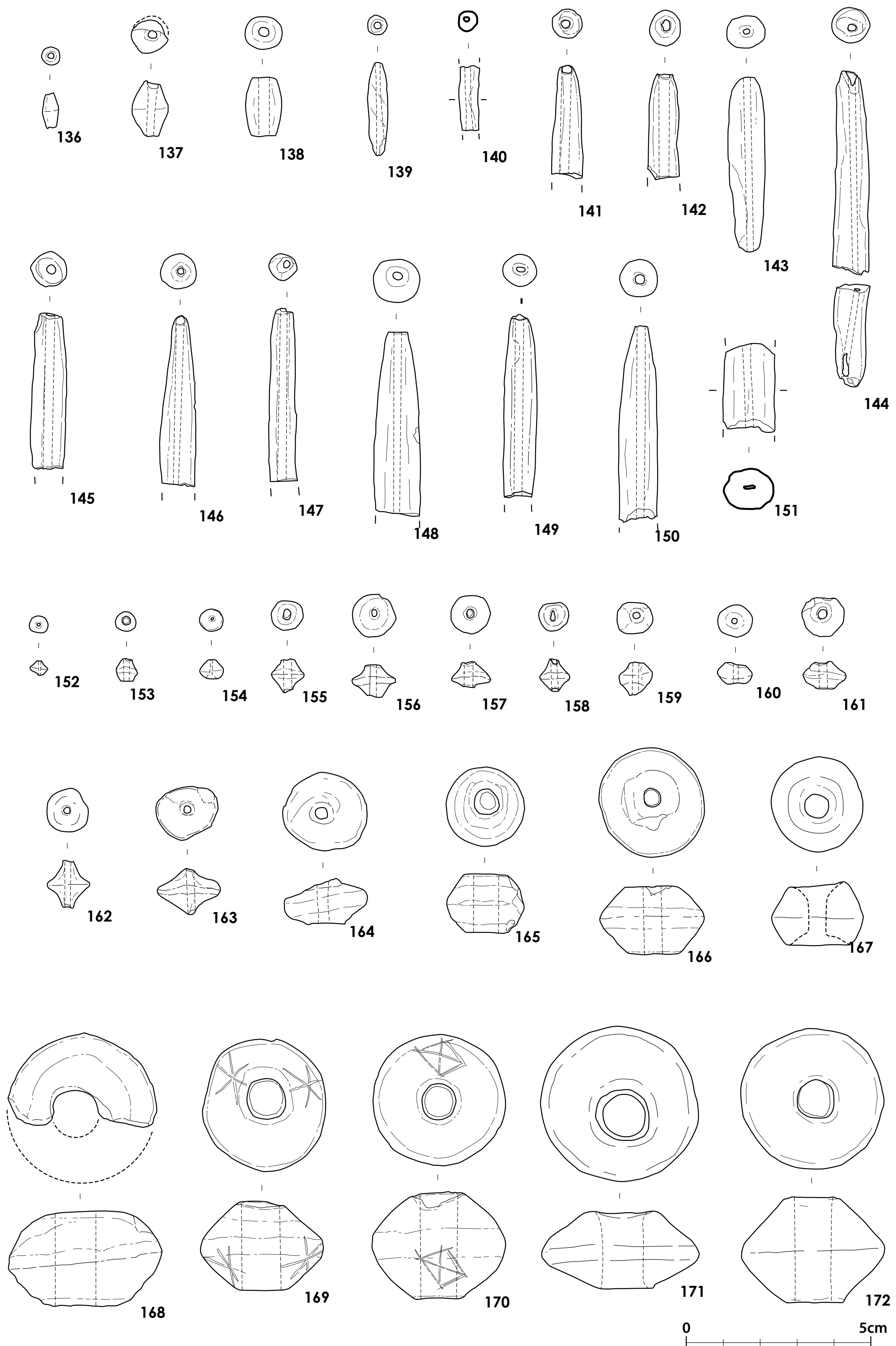


Figure 7.63 Terracotta beads (2:3)

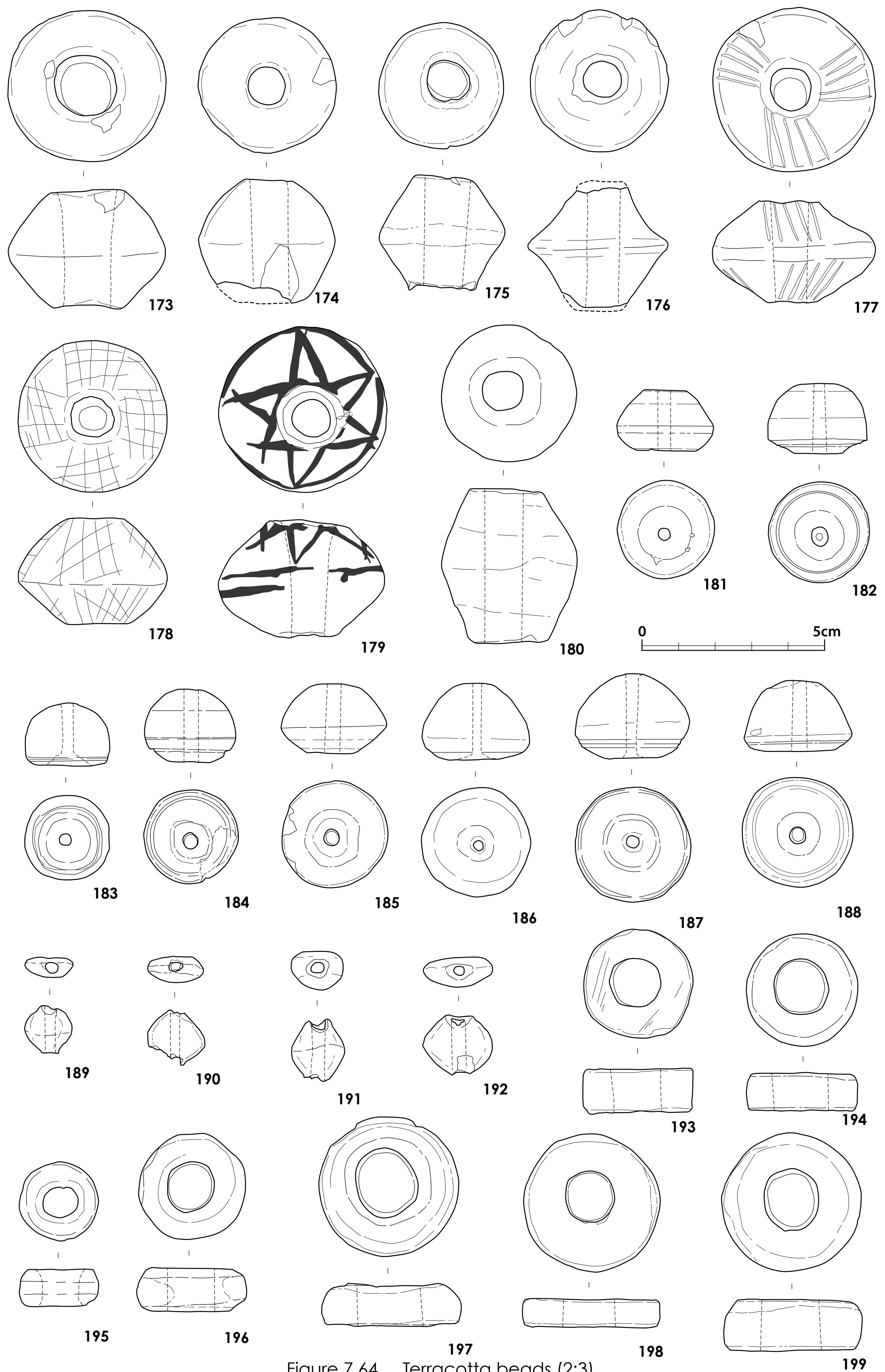


Figure 7.64 Terracotta beads (2:3)

200 201 202 203 204

205 206 207 208

209 210 211 212

0 5cm

Figure 7.65 Terracotta beads (2:3)

Figure 7.66 Pie chart showing percentages of types of terracotta beads

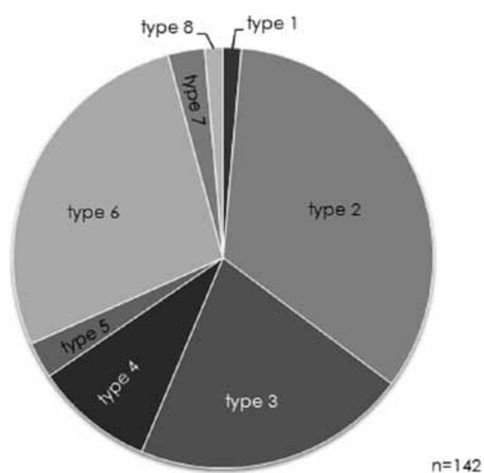


Figure 7.67 Scattegram showing a relation between diameter and height of terracotta beads

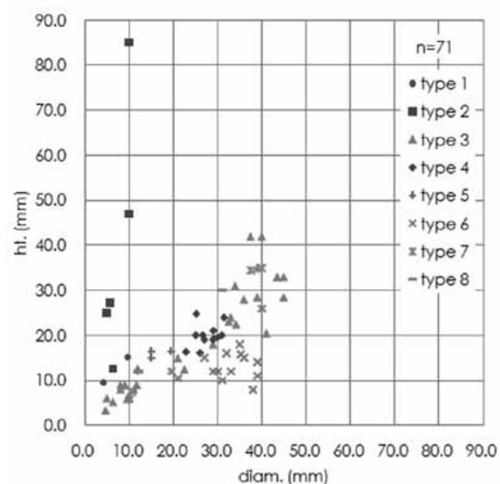




Figure 7.68 Terracotta beads (1:1)



Figure 7.69 Terracotta beads (1:1)



Figure 7.70 Terracotta beads (1:1)



Figure 7.71 Terracotta beads (1:1)

one to the North Extension (Phase 4), and two to the North Area (Phase 4).

[Type 7]

Type 7 is represented by four specimens which measure 10.5 mm to 40.0 mm in diameter and 7.5 mm to 35.0 mm in height (T-209, T-210).

Two specimens come from the Central Area (Phase 5), one from the Northwest Area (a dump), and one from the North Extension (Phase 5).

[Type 8]

Type 8 is represented by two specimens (T-211, T-212). One specimen (T-211) measures 12.0 mm in diameter and height, and theother specimen (T-212) measures 31.0 mm in diameter and 30.0 mm in height.

Both specimens come from the Central Area (Phase 5).

(Konasukawa/Uesugi)

3.8 Cakes

(Figures 7.72 - 7.75)

An enormous number of terracotta cakes were unearthed in the excavations, but most of them were found in fragments. While they were found throughout the site, a fair number of them were discovered in clusters on floor levels in Phase 5 of the Central Area. Some clusters were located near hearths. A fair number of the cakes show traces of secondary heating as indicated by their uneven colours and sooty surfaces. These facts may indicate that the terracotta cakes were used in hearths in relation to fire on some occasions. However, the insufficient documentation of contexts and specimens means that we cannot come to a final conclusion regarding the usage of the terracotta cakes.

22 of better preserved were selected for detailed documentation. They can be classified into the following types based on shapes.

Type 1 Circular plan and flat rectangular section.
Type 2 Triangular plan and flat rectangular section.
Type 3 Circular plan and lenticular section.
Type 4 Oblong plan and oblong section.

[Type 1]

Among specimens of this type (T-215, T-233) one complete specimen was found (T-215). This type is well modelled and have a square edge.

[Type 2]

This type is also well modelled with a square edge (T-213, T-214). In complete specimens they measure 8.5 cm to 8.7 cm in length, 8.2 cm in width and 2.4 cm to 3.0 cm in thickness. They are 100 g to 300 g in weight.

[Type 3]

This type (T-216 - T-226, T-232) is quite crudely modelled, showing finger impressions on the surface. It measures 7.0 cm to 10.4 cm in length and 2.15 cm to 4.1 cm in thickness and weighs 100 g to 300 g.

[Type 4]

This type is also crudely modelled (T-227 - T-231,). Some specimens have a hollow on the vertical sides and others show a pair of hollows made on the lateral sides. They measure 8.5 cm to 10.2 cm in length, 5.2 cm to 7.0 cm in width and 3.25 cm to 4.3 cm in thickness and weigh 100 g to 250 g.

Among the documented specimens, pre- and post-firing incisions were observed in the nine specimens. Those with pre-firing incisions are three in number and those with post-firing graffiti are six in number.

Among those with pre-firing incisions, T-223 has short incised lines near the edge. In T-232, X-shaped incised lines are executed in the centre of one side. T-234 shows a rough chequerboard pattern and a row

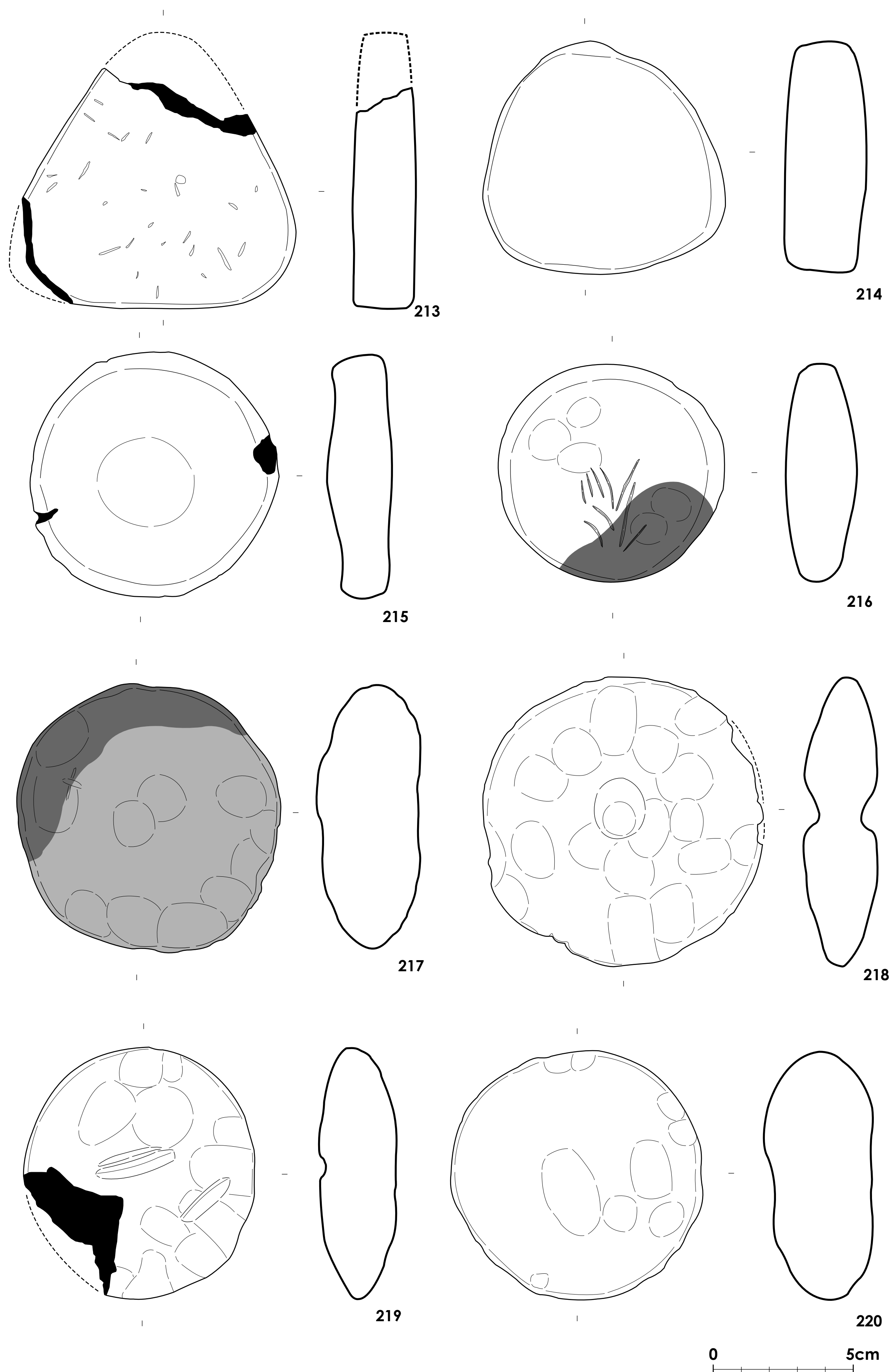


Figure 7.72 Terracotta cakes (1:2)

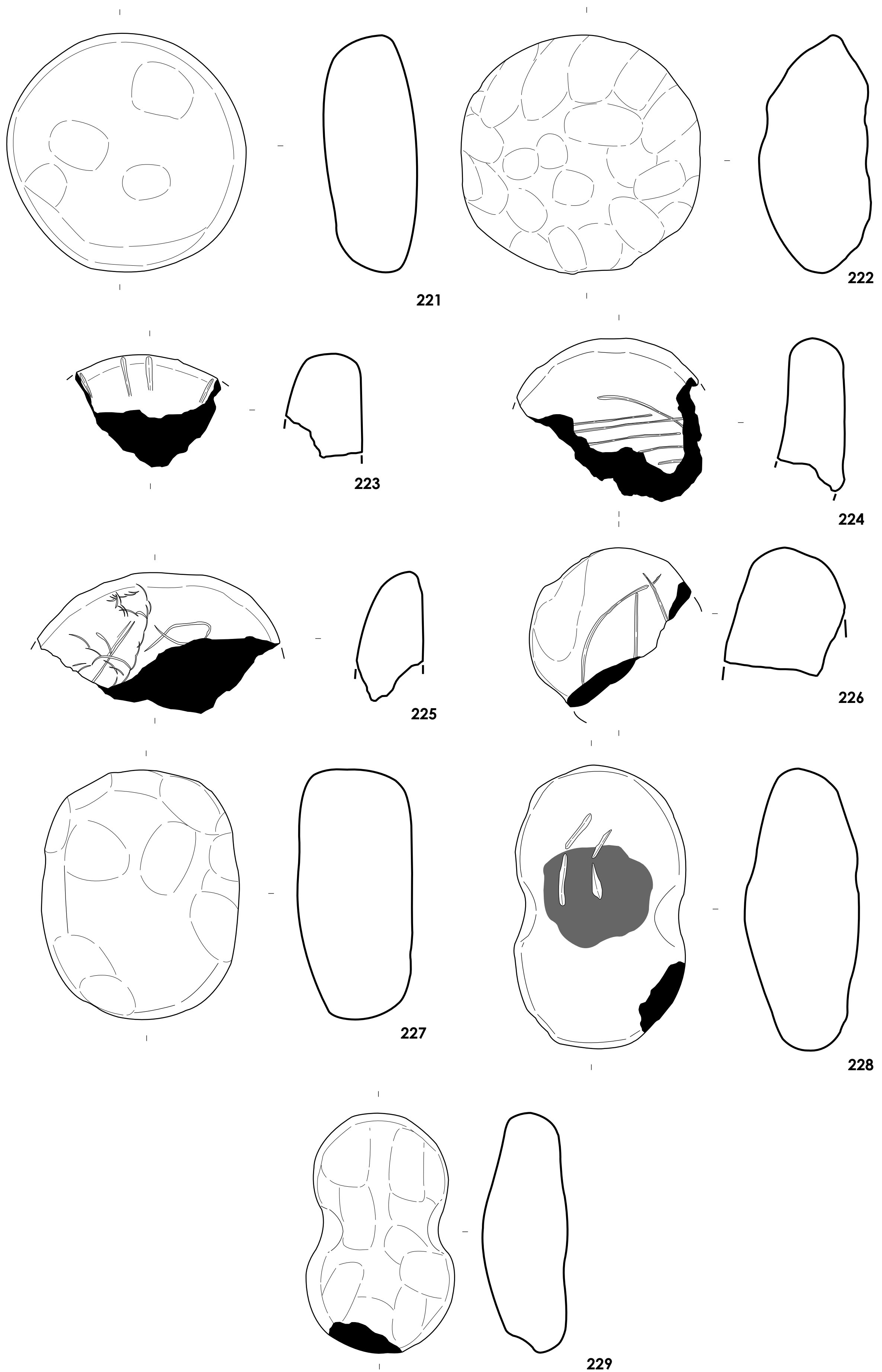


Figure 7.73 Terracotta cakes (1:2)



Figure 7.74 Terracotta cake (1:2)



Figure 7.75 Terracotta cake (1:2)

of dots on one side.

In those with post-firing graffiti, T-216 has a short straight and curvilinear lines on one side. T-224 shows a combination of curvilinear lines and parallel oblique lines. T-225 is executed irregularly with multiple nail-like incisions. In T-226 a leaf-like motif is intact on one side. T-228 has a pair of straight lines. T-233 shows multiple X-shaped patterns.

(Uesugi)

3.9 Balls

(Figure 7.76, Table 7.12, 7.13)

76 specimens of terracotta balls were found in the excavations. They are all modelled by hand and have no decoration.

The size of the 52 complete specimens ranges from 0.69 cm to 7.05 cm in diameter. In Table 7.12, their sizes are shown in 1 cm classes. This chart shows that terracotta balls concentrate in a range between 1.1 and 3.0 cm.

The weight of the balls varies from 1 g to 124 g. They are shown by 10 g classes in Table 7.12, which shows a preponderance of balls weighing 1 - 10 g. Those heavier that 31 g are very limited in number.

The terracotta balls were found predominantly in Phase 5 of the Central Area (Table 7.13). Limited numbers also occur in Phases 2 - 4 in the Central Area.

(Endo)

3.5 Discs

(Figures 7.77 - 7.80, Table 7.14)

23 specimens of discs were found in the excavations (T-259 - T-280). Fourteen specimens are made from potsherds and nine specimens are made from clay. Those reusing potsherds measure 2.1 cm to 5.9 cm in diameter and 0.54 cm to 2.05 cm in thickness, and those made of clay measure 2.2 cm to 5.5 cm in diameter and 0.88 cm to 1.54 cm in thickness. In one reused potsherd specimen (T-264), an unfinished perforation is observed on one side.

16 specimens of discs were found in the Central Area (Phase 5), one specimen in the West Area, three specimens in the Northwest Area (a dump), and three specimens in the North Extension (Phase 4) (Table 7.14).

(Konasukawa/Uesugi)

3.10 Pyramidal objects

(Figures 7.77, 7.81)

These objects are distinguished by a triangular pyramid shape with rounded edges. Six specimens were found in the excavations. They show a uniform range of 1.5 cm in height, 1.4 cm to 1.5 cm in width and 1.4 cm to 1.5 cm in thickness. They are made from fine clay showing a orange colour clay with no slip and decoration.

All the specimens were found in the Central Area. Two specimens belong to Phase 2 and two to Phase 5.

(Konasukawa/Uesugi)

3.11 Stopper-like objects

(Figure 7.77, 7.82, Table 7.15)

The objects in this category can be classified into two types, i.e. Type 1 with a cylindrical shape (T-287 - T-291) and Type 2 with an elongated shape with rounded ends (T-281 - T-286). Those with slightly concave sides are included in Type 1. Type 1 is represented by 10 specimens and Type 2 by four specimens. Type 1 measures from 2.3 cm to 3.5 cm in length, and 1.2 cm to 1.6 cm in diameter at ends. Type 2 measures from 2.2 cm to 4.0 cm in length and 1.0 cm to 1.9 cm in max diameter. They are made of fine clay showing a orange colour clay with no slip.

Eight specimens were found in the Central Area (one specimen in Phase 2 and seven specimens in

Figure 7.76 Terracotta balls (1:2)

Table 7.12 Diameter and weightdistribution of terrcotta balls

Class	***Range (cm)***	***no.***
1	0.1-1.0	2
2	1.1-2.0	25
3	2.1-3.0	27
4	3.1-4.0	10
5	4.1-5.0	8
6	5.1-6.0	1
7	6.1-7.0	0
8	7.1-8.0	1

weight (g)	***no.***
1-10	26
11-20	7
21-30	8
31-40	1
41-50	1
51-60	1
61-70	1
71-80	0
81-90	0
91-100	0
101-110	1
111-124	1

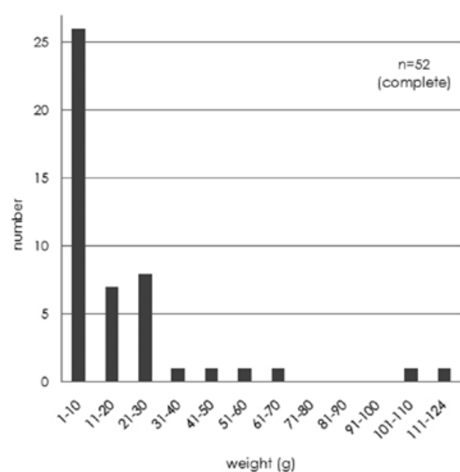


Table 7.13 Area-wise stratigraphic distribution of terracotta balls

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	3	0	0	0	0	0	0	0	3
Phase 5	61	61	0	0	0	0	0	0	0
Phase 4	1	0	1	0	0	0	0	0	0
Phase 3	1	1	0	0	0	0	0	0	0
Phase 2	4	0	0	0	4	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	6	0	0	4	1	0	1	0	0
Total	76	62	1	4	5	0	1	0	3

Table 7.14 Area-wise stratigraphic distribution of terracotta discs

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	16	16	0	0	0	0	0	0	0
Phase 4	3	0	0	0	0	3	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	4	0	0	1	3	0	0	0	0
Total	23	16	0	1	3	3	0	0	0

Table 7.15 Area-wise stratigraphic distribution of terracotta stopper-like objects

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	8	7	0	0	0	1	0	0	0
Phase 4	2	0	2	0	0	0	0	0	0
Phase 3	1	0	0	0	0	1	0	0	0
Phase 2	3	1	0	0	2	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	14	8	2	0	2	2	0	0	0

Phase 5). In addition, two specimens each were found in the East Area (Phase 4), the Northwest Area (Phase 2), and the North Area (one each in Phases 3 and 5) Table 7.15). (Konasukawa/Uesugi)

3.12 Drum-shaped objects

(Figure 7.77, 7.83)

Five drum-shaped objects were identified. They measure from 2.5 cm to 3.9 cm in diameter and from 1.8 cm to 3.3 cm in height. One specimen (T-295) is decorated with a dotted pattern on one face.

All the specimens were found in the Central Area (Phase 5).

(Konasukawa/Uesugi)

3.13 Miniature vessel

(Figure 7.84, 7.85)

Three specimens of miniature vessels were found in the excavations. T-299 has a diameter of 4.1 cm and a height of 1.5 cm. T-300 has a shallow hollow measuring 1.8 cm in diameter and 0.8 cm in height. T-301 seems to have had a rectangular shape with rounded ends.

Three specimens come from the Central Area

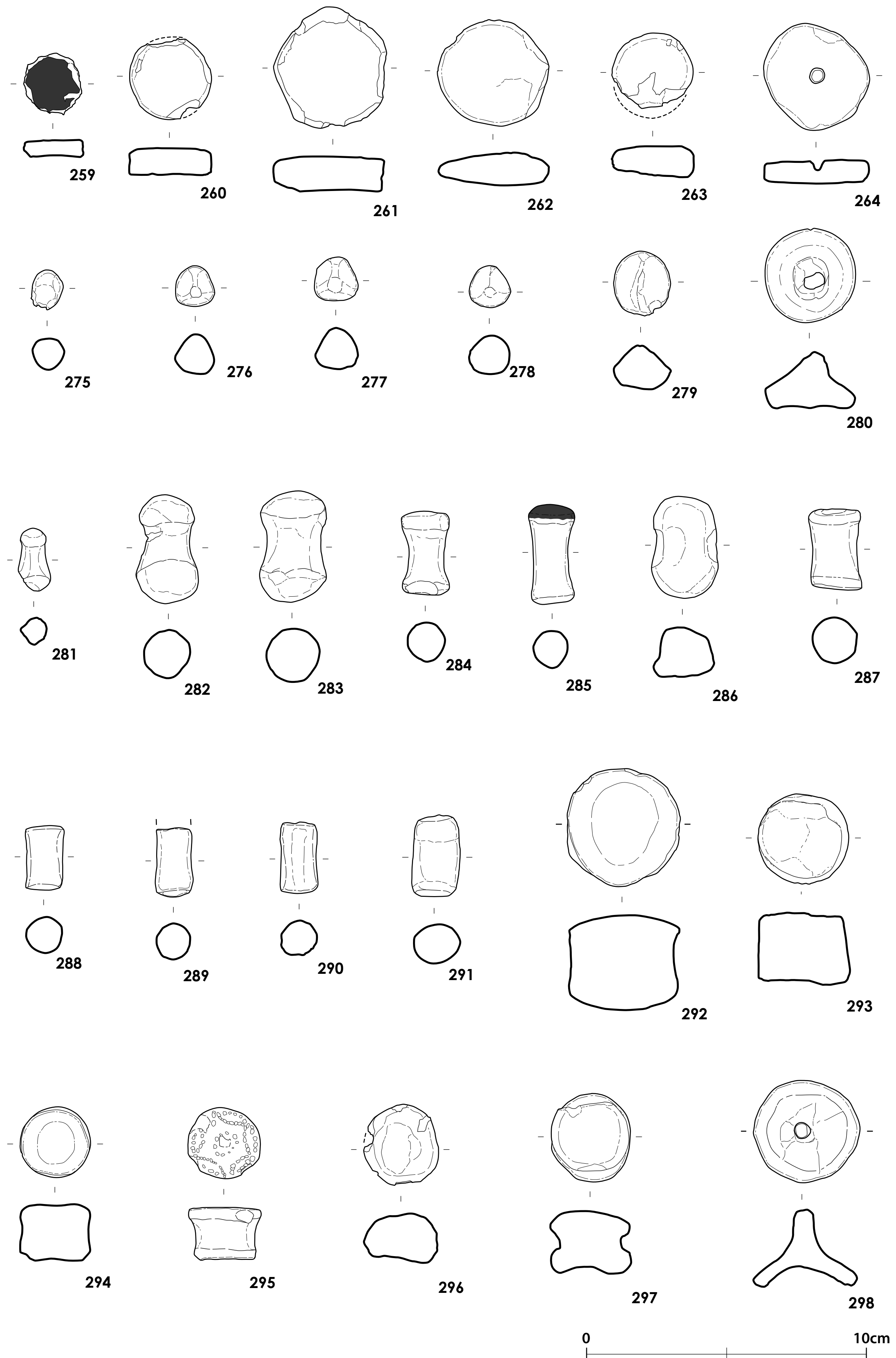


Figure 7.77 Terracotta miscellaneous objects (1:2)



Figure 7.78 Terracotta objects (1:1)



Figure 7.79 Terracotta objects (1:1)



Figure 7.80 Terracotta objects (1:1)



Figure 7.81 Terracotta objects (2:1)



Figure 7.82 Terracotta objects (1:1)



Figure 7.83 Terracotta objects (1:1)

(Phase 5) and one specimen from the North Area (Phase 4).

(Uesugi)

3.12 Other objects

(Figure 7.84)

Nineteen fragments of some indeterminate shapes were found in the excavations. Most of them are not described here as their preserved condition makes it difficult.

One specimen (not illustrated) seems to be a fragment of a rattle having a long neck with a notched head executed with incised dots.

T-296 has a circular plan crudely modelled. It was found in the Central Area (Phase 5). Most probably it may belong to the Historical period.

T-297 is similar to the drum-shaped object in shape but has a groove around the body. This specimen also come from the Central Area (Phase 5).

T-298 has a hollow conical shape with a pointed end. It measures 3.7 cm in diameter and 2.7 cm in height. This may be a lid for a miniature vessel. This object was found from the Central Area (Phase 5).

(Uesugi/Konasukawa)

4 STONE OBJECTS

4.1 Outline

(Tables 7.16, 7.17)

In total, 4256 specimens of stone objects were retrieved from the excavations. As shown in Table 7.16, steatite objects (3675 specimens), followed by carnelian objects (364 specimens), are dominant in number. In terms of forms, most are beads (4044 specimens), followed by balls (36 specimens), blade/bladelet assemblage (35 specimens) and poundingstones (46 specimens). Carnelian, agate, amazonite and lapis lazuli are exclusively used in beads. Jasper objects consist of 25 beads, one pendant, one pebble and two pieces of fragments. The two steatite seals described above together with a vast number of beads (3675 specimens) are included among the steatite objects. Chert occurs in the blade/bladelet assemblage and in weights, while sandstone is exclusively used for poundingstones and querns.

(Uesugi)

4.2 Definition stones

(Figures 7.86 - 7.89, Table 7.17)

Steatite

Steatite is composed mainly of the mineral talc and is a soft metamorphic rock in nature (Mohs' scale hardness of 1 to 2.5). It is widely used for seals and ornaments in Indus sites. At Farmana the steatite artefacts are represented by seals and beads. While, in original, it is graded from deep black to pure white with intermediate shades of red, green or yellow (Law 2011: 71), it turns to white in colour when heated in high temparature. Those from Farmana all exhibit white in colour indicating that they were heated in the manufacturing process.

Chert

The chert is of microcrystalline silicates, specially defined as having a granular structure (Rapp 2002: 71-72). Visually, it is defined as those opaque microcrystalline silicates having a colour ranging from light grey to black or a shade of brown (Law 2011: 74). Those from Farmana are all represented by a tan-grey variety in colour, which is supposed to be derived from the Rohri Hills in Sindh. This tone is used only for the blade/bladelet assemblage at Farmana.

Agate-jasper

The agate-jasper is also composed of micro-crystalline silicates showing a wide variety in visual appearances. In this report those with translucent variety are classified as the agate while those with



Figure 7.84 Terracotta objects (1:1)



Figure 7.85 Terracotta objects (1:1)

Table 7.16 Artefact varieties of stone objects

Variety of objects	*no.*
Seals	4
Beads	4044
Unfinished beads	46
Pendants	1
Poundingstones	46
Querns	22
Balls	36
Blade/bladelet assemblage	35
Weights	2
Indeterminate objects	20
Total	4256

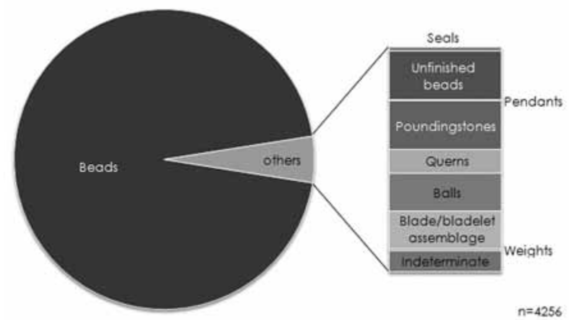
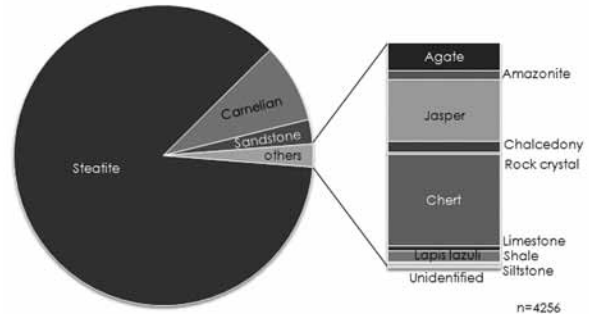


Table 7.17 Stone varieties in all stone artefacts

Stone variety	*no.*
Agate	13
Carnelian	364
Amazonite	4
Jasper	29
Chalcedony	5
Rock crystal	1
Steatite	3675
Chert	43
Limestone	2
Lapis lazuli	5
Sandstone	112
Shale	1
Siltstone	1
Unidentified stone	1
Total	4256



opaque microcrystalline silicates are as the jasper showing a colour variety of red, green or yellow (Law 2011: 73).

Among those from Farmana, yellow, white-grey and black are represented in colours. Most of them are banded in colours. In the jasper, red, green, dark grey, yellow banded red, white-banded red, white-banded black, reddish grey-banded white and white and orange-banded green are found.

In Indus sites, these stones are used dominantly for ornaments. Also at Farmana, they represent mainly beads. In the green jasper, one specimen of amulet was found.

The carnelian is a variety of agate which shows translucent red-orange colour. It seems likely that they were heated in the manufacturing process. This stone is used for beads.

Chalcedony

This tone is also composed of microcrystalline silicates having fibrous structure (Rapp 2002: 71-72). Three specimens of beads from Farmana may represent this stone, though some of them may be of quartz. One specimen exhibits a black band over white body.

Limestone

Only one specimen of beads is possibly of the limestone. It exhibits a tan-grey colour.

Lapis lazuli

The lapis lazuli is a rock containing calcite, diopside, pyrite and lazurite, the last of which provides its characteristic blue colour (Law 2011: 80). Although the azurite and sodalite show colours

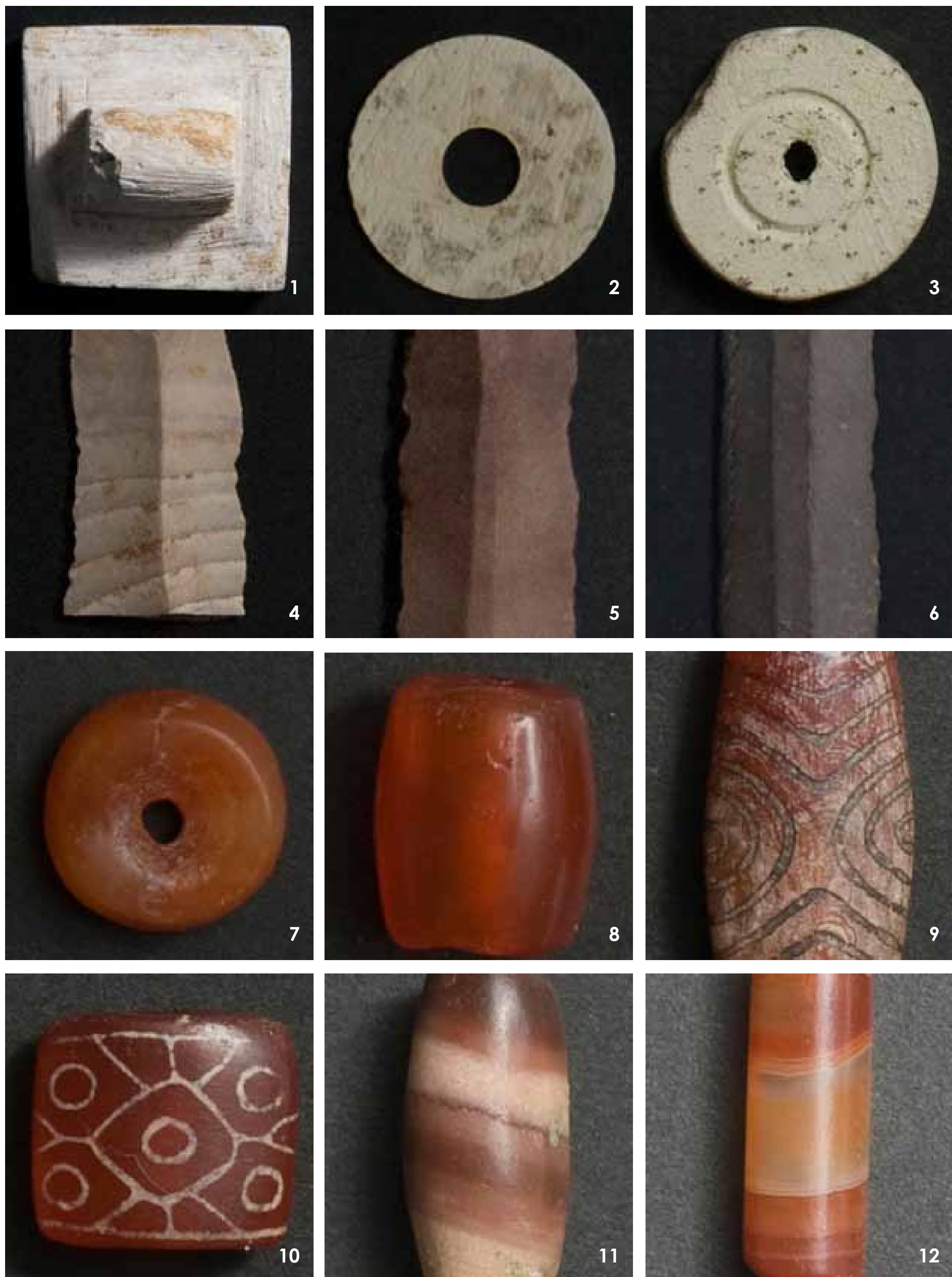


Figure 7.86 Variety of stones from the settlement Area
1-3: Steatire, 4-6: Chert, 7-12: Carnelian



Figure 7.87 Variety of stones from the settlement Area
1-5: Agate, 6-12: Jasper



Figure 7.88　Variety of stones from the settlement Area
1-3: Jasper, 4-6: Amazonite, 7-9: Jasper or Kaolinite, 10: Chalcedony, 11: Siltstone, 12: Limestone

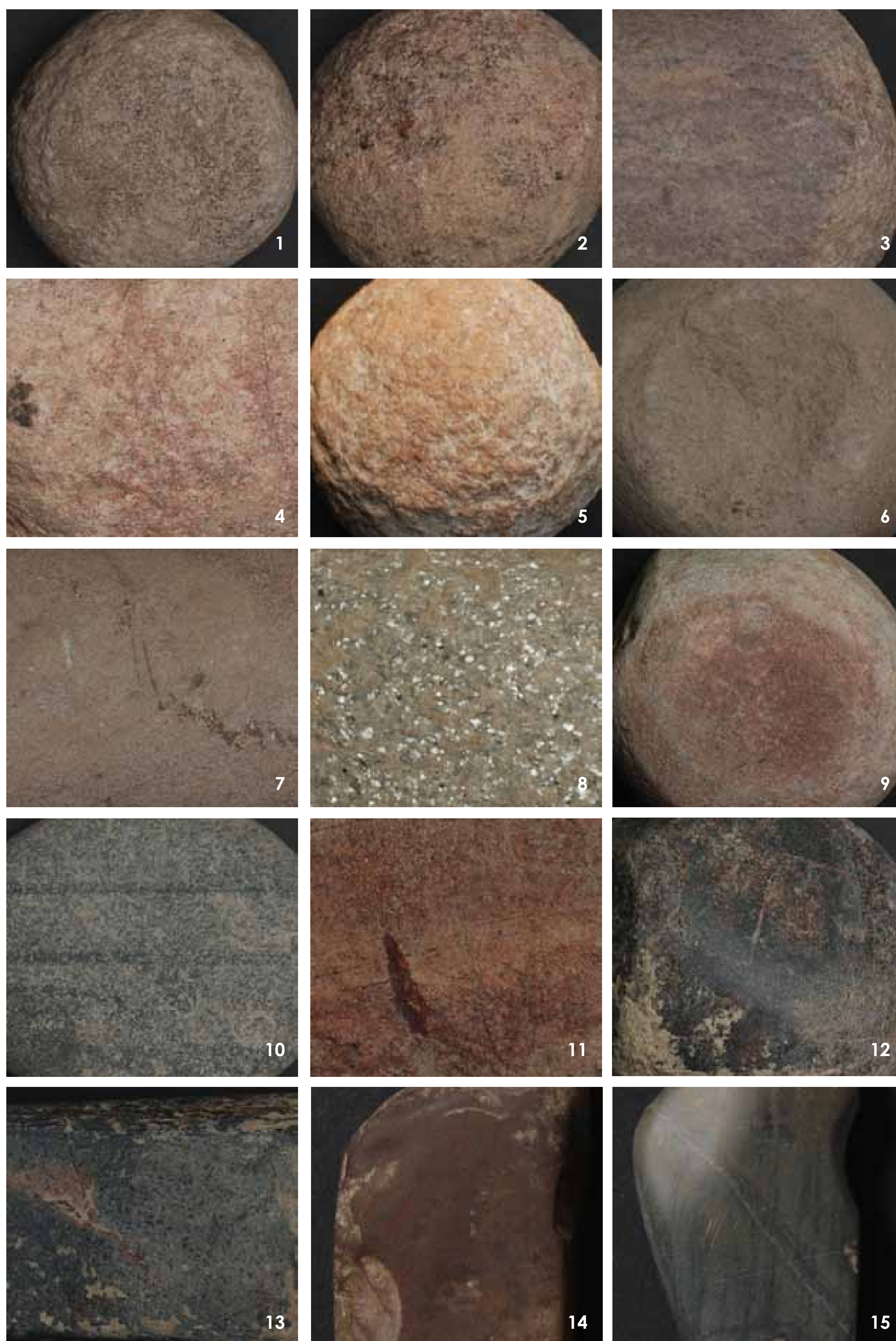


Figure 7.89 Variety of stones from the settlement Area
1-13: Sandstone, 14: Chert, 13 -15: Shale

similar to that of lapis lazuli, the lapis lazuli can be distinguished from those stones based on hue, luster, crystal habit and visual mineral associations (Lai 2011: 80). The lapis lazuli has a single source in Badakhshan in northern Afghanistan.

This stone is identified in beads at Farmana, although a decisive distinction is not made from azurite and sodalite. Besides, in faience beads, there are a few specimens which exhibit colours similar to that of lapis lazuli. It is specially mentioned that misidentifications may be included.

Amazonite

This stone is a variety of the feldspar mineral microcline (potassium aluminium silicate), showing a prominent cleavage face with white-green to blue-green colours (Law 2011 84). A source is identified in north Gujarat (Law 2011: 84). At farmana four specimens of beads are identified as this stone.

Kaolinite

This stone is a variety of claystone showing a red colour in the case that it includes hematite. Its source have been identified in the Hazara district and in the Salt Range in northern Pakistan (Law 2011: 88). At Farmana, dark brown and yellow ones are found along with red ones, although they may be misidentified. They are used for beads.

Rock crystal

One specimen of a bead may represent a rock crystal. It exhibits transparent colour.

Siltstone

This stone is a variety of sedimentary rocks. One specimen of a bead was found at Farmana, showing a grey colour.

Sandstone

Those from Farmana are coarse in nature including bits of quartz. They exhibit grey and pinkish colours. The pinkish variety has a source in the Kaliyana Hills in the southern part of Haryana, which may be a source of sandstone for Farmana. It is soft in nature widely used for poundingstones and querns.

(Uesugi)

4.2 Stone beads

(Figures 7.90 - 7.116, Tables 7.18 - 7.42)

The excavations yielded a total number of 4044 stone beads. Among them, the following variety of stones has been identified (Table 7.18).

Carnelian beads

(Figures 7.90 - 7.98, Tables 7.20 - 7.34)

The number of 326 carnelian beads were unearthed during the excavations. They are classified into two primary categories as follows.

Category	no.
Plain carnelian beads	301
Etched/bleached carnelian beads	25

These two categories are distincti in terms of their shapes. The plain carnelian beads can be classified into the following shapes on the basis of their plan and profile.

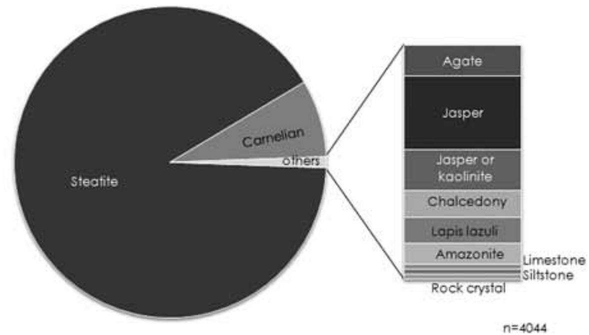
	Plan	Profile
Type 1	circular	truncated biconical
Type 2	circular	cylindrical
Type 3	circular	long barrel
Type 4	circular	short barrel
Type 5	circular	truncated globular
Type 6	circular	spherical
Type 7	circular	flat biconical
Type 8	circular	disc
uncertain		

[Type 1]

Type 1 (St-1 - St-20, St-65 - St-75) is the

Table 7.18 Percentages of stone varieties of beads

Variety of stones	*no.*
Steatite	3671
Carnelian	326
Agate	6
Jasper	16
Jasper or kaolinite	8
Chalcedony	5
Lapis lazuli	5
Amazonite	4
Limestone	1
Siltstone	1
Rock crystal	1
Total	4044



most dominant one among carnelian beads (228 specimens). These beads measure 2.48 mm to 10.25 mm in diameter and 1.01 mm and 4.66 mm in height. In most cases, the hole is perforated by pecking. However, some specimens show no clear traces of pecking but rather have a smooth surface around the hole indicating either that the perforation was made by other tools or that grinding was done after the perforation.

[Type 2]

This type is represented by 19 specimens (St-21 - St-26, St-77). They measure 3.14 mm to 6.62 mm in diameter and 7.87 mm to 20.87 mm in height and are perforated by a drill.

[Type 3]

The distinction between short barrel and long barrel is made based on the ratio of height to diameter, the border being 1.50. Those with ratios of more than 1.51 are defined as long barrel beads. The 17 specimens of this type represent this type measure from 2.90 mm to 5.97 mm in diameter and from 4.57 mm to 15.71 mm in height (St-27 - St-33, St-39). They are perforated by drill.

[Type 4]

The short barrel bead is defined as having ratios of height to diameter of less than 1.5. Fifteen specimens are identified as belonging to this type (St-34 - St-38). They measure 3.63 mm to 8.33 mm in diameter and 5.43 mm to 11.64 mm in height. They are perforated by drill.

[Type 5]

This type is represented by two specimens (St-40, St-41) which measure 7.82 mm to 8.56 mm in diameter and 5.73 mm to 7.72 mm in diameter. They are perforated by drill.

[Type 6]

Six specimens with a spherical body are identified as belonging to this type (St-42, St-43, St-84). They measure 7.39 mm to 10.48 mm in diameter and 5.88 mm to 9.51 mm in height. In some specimens they are irregular in shape. They are perforated by drill.

[Type 7]

This type is distinguished by a flat biconical shape. Only one specimen represents this type (St-44). It measures 9.67 mm in diameter and 4.03 mm in height. The perforation seems to have been done with a pecking technique.

[Type 8]

This type may be regarded as a variant of Type

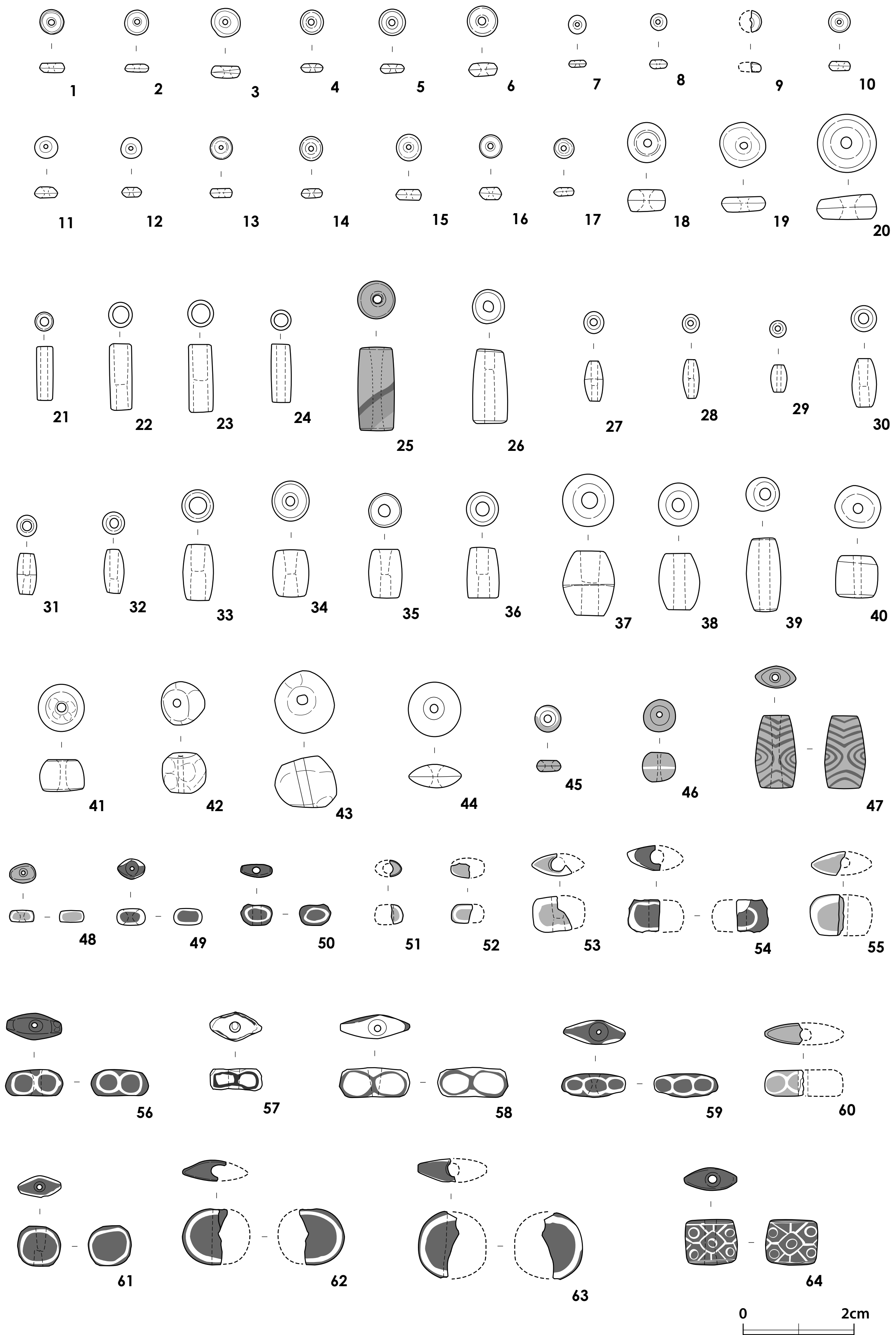


Figure 7.90　Carnelian beads (1:1)

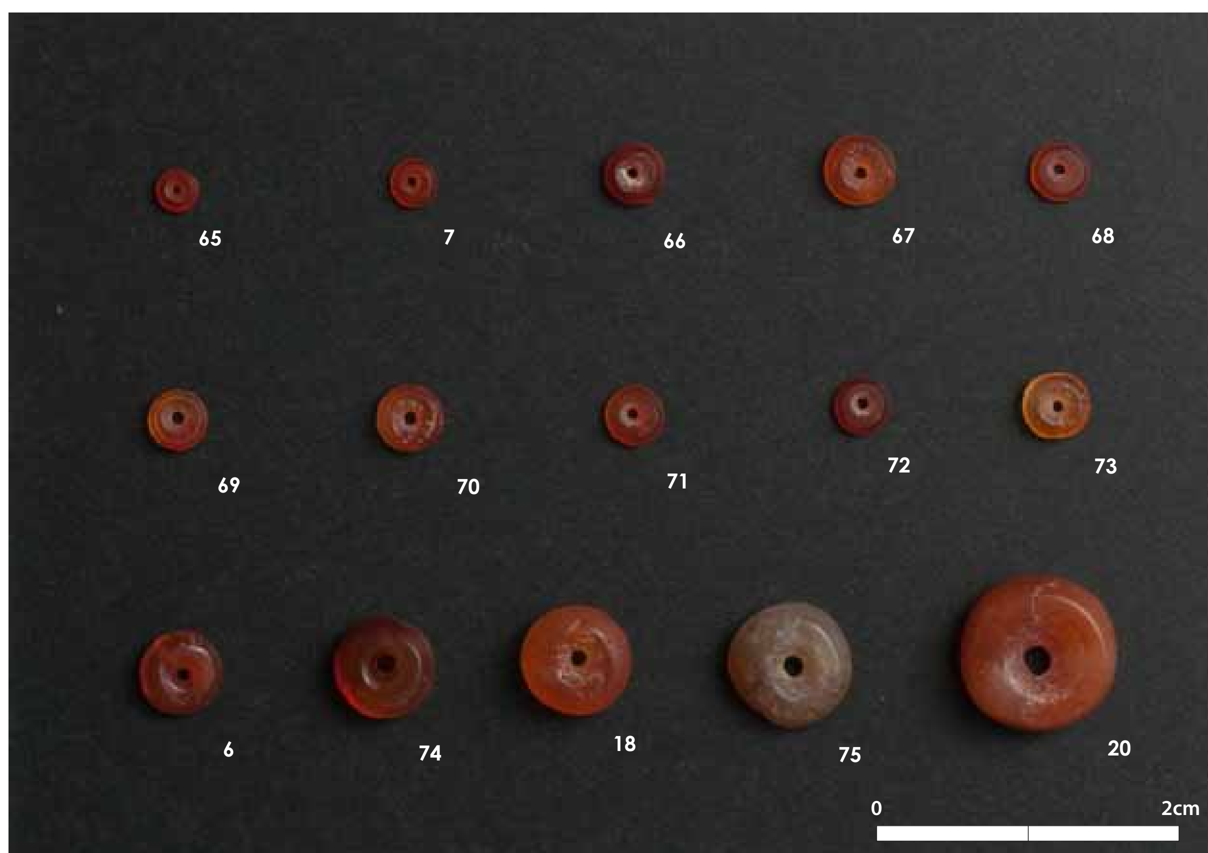


Figure 7.91 Stone beads (2:1)

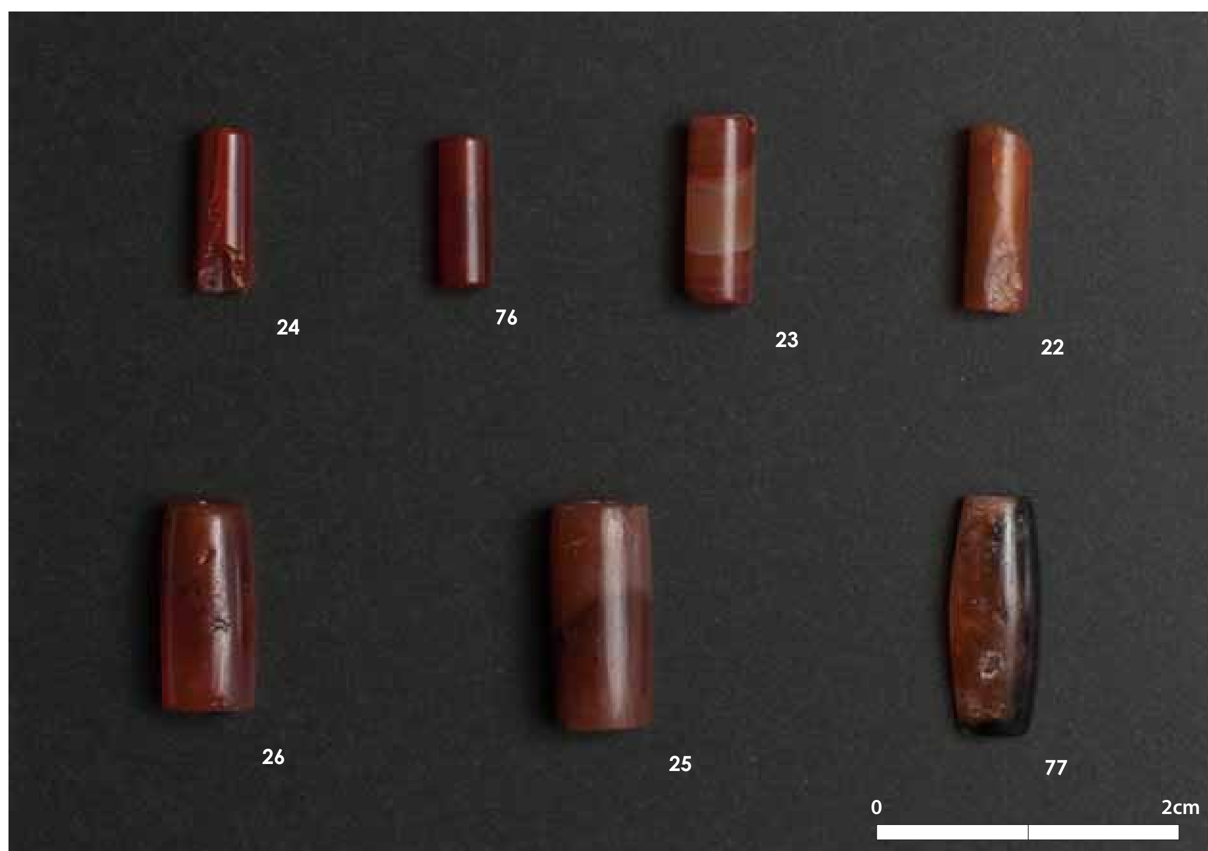


Figure 7.92 Stone beads (2:1)

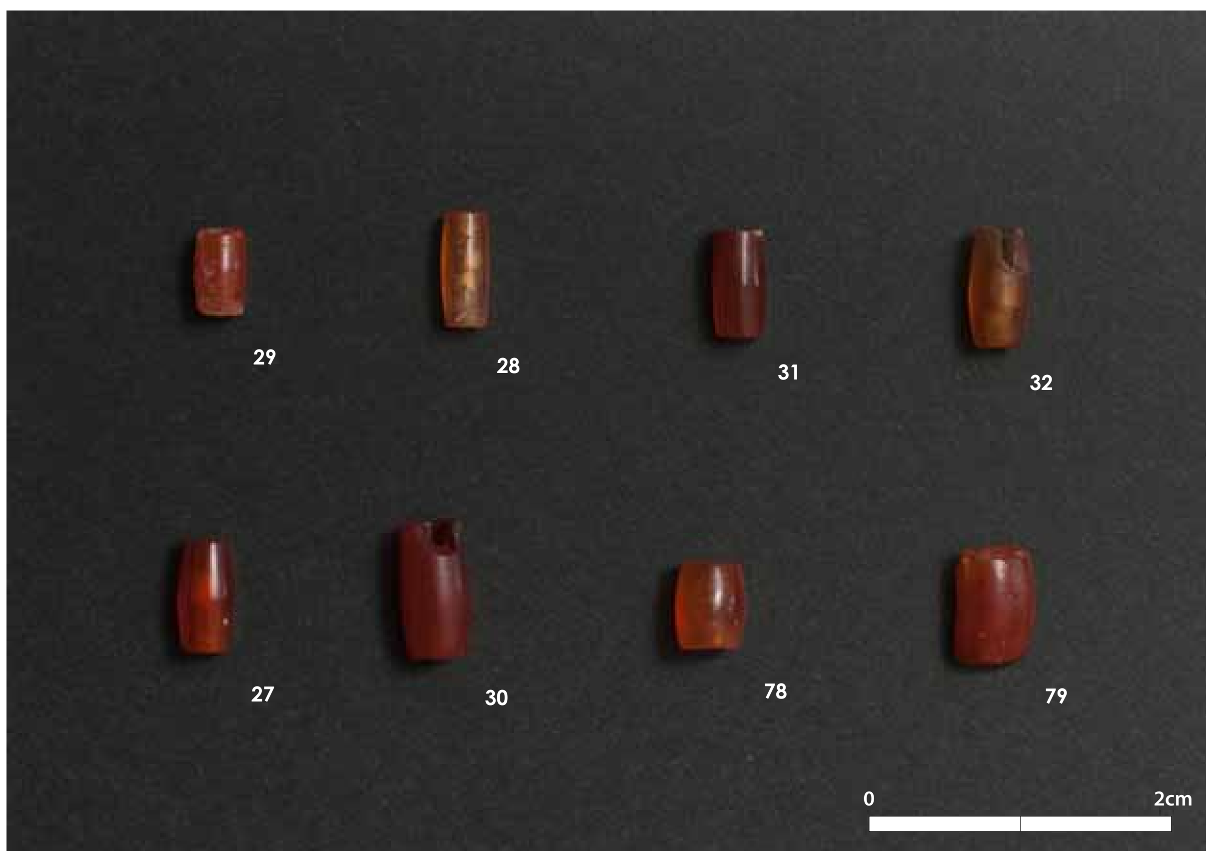


Figure 7.93 Stone beads (2:1)



Figure 7.94 Stone beads (2:1)

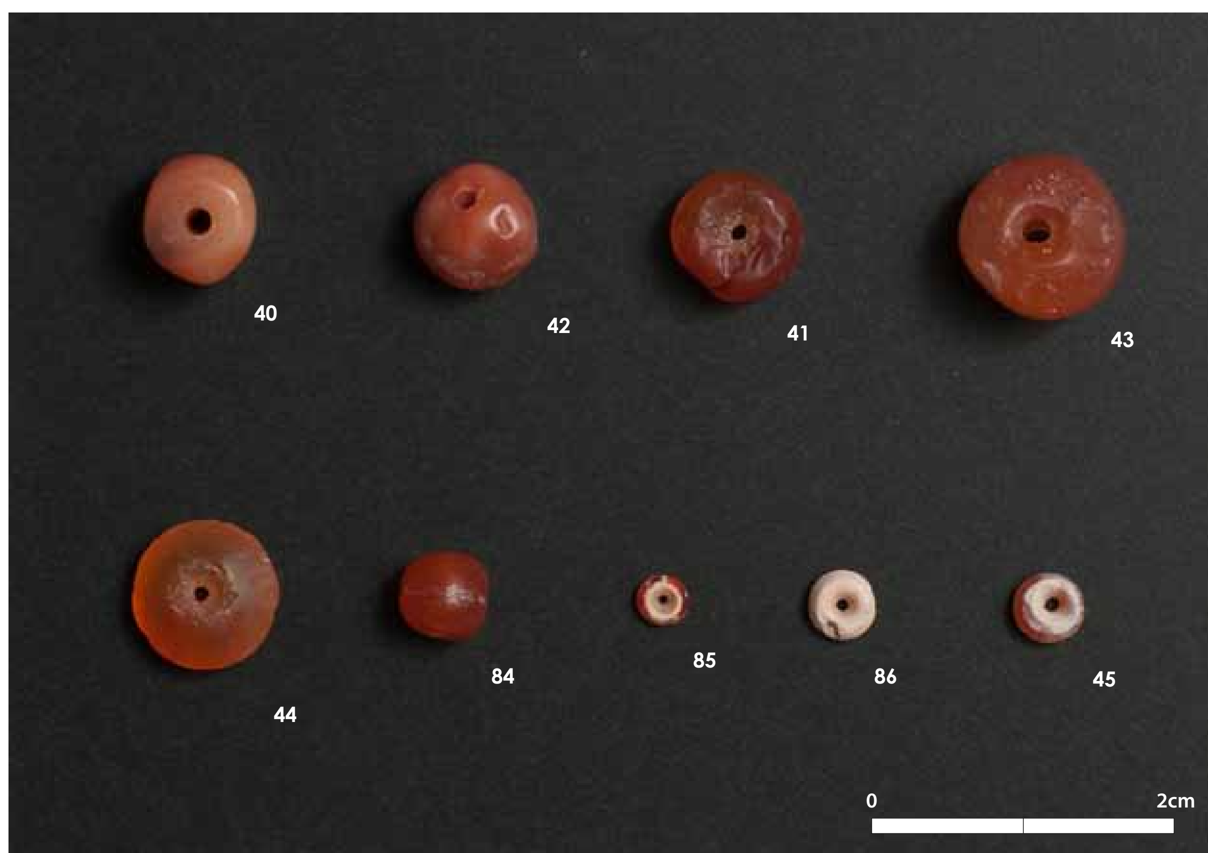


Figure 7.95 Stone beads (2:1)

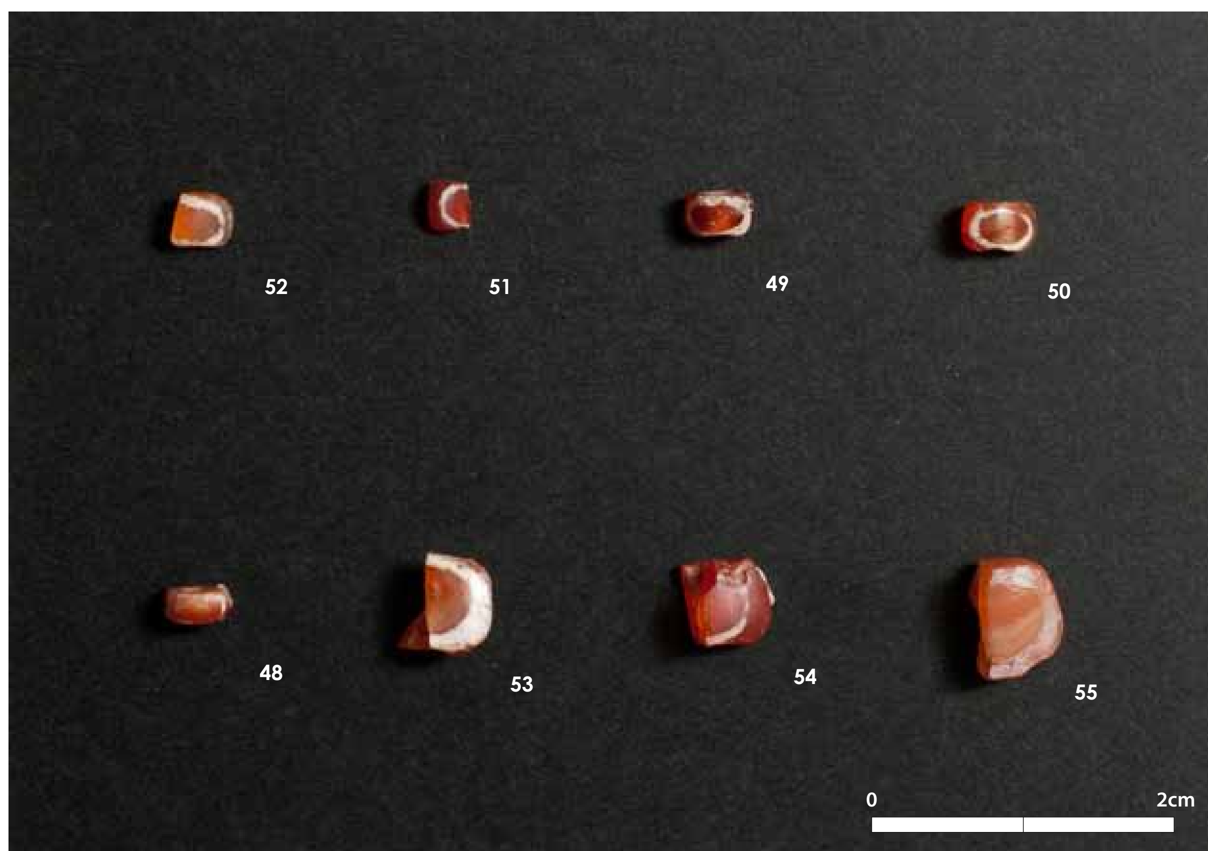


Figure 7.96 Stone beads (2:1)

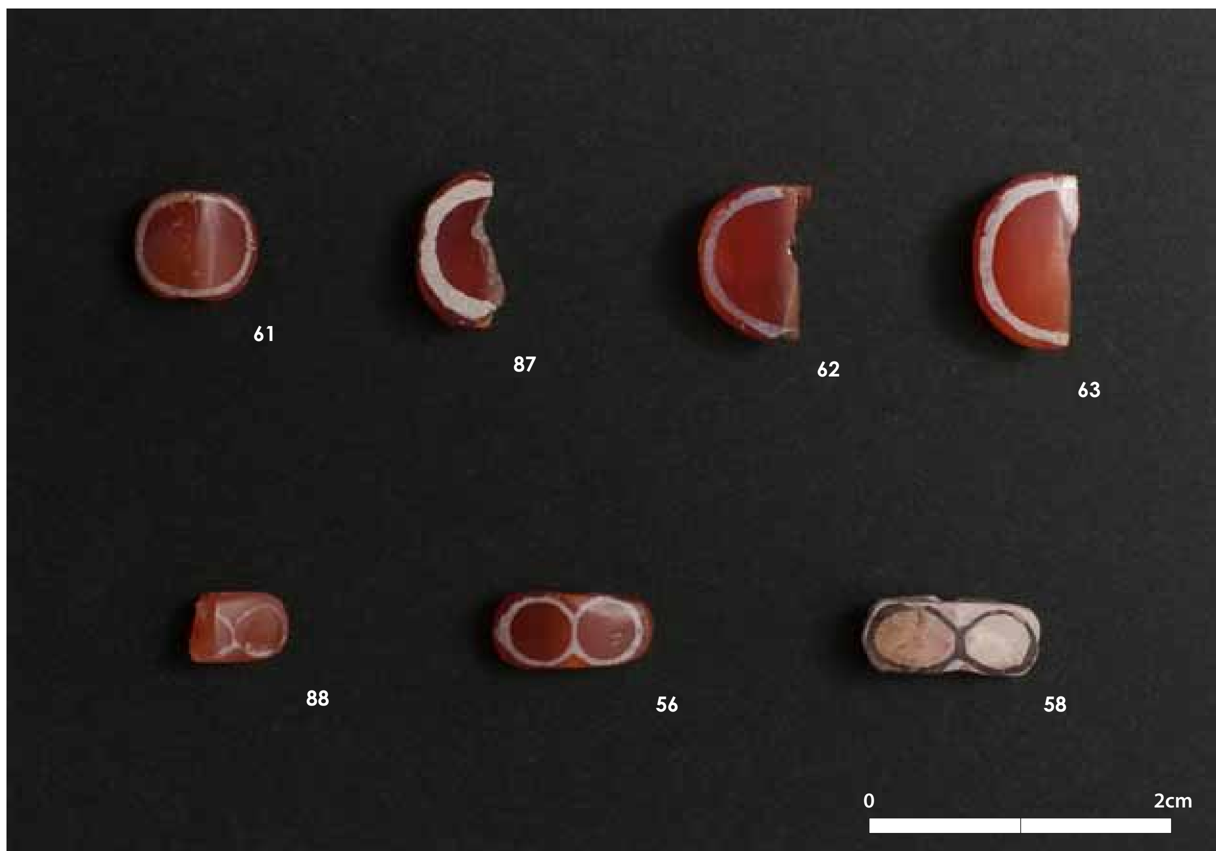


Figure 7.97 Stone beads (2:1)

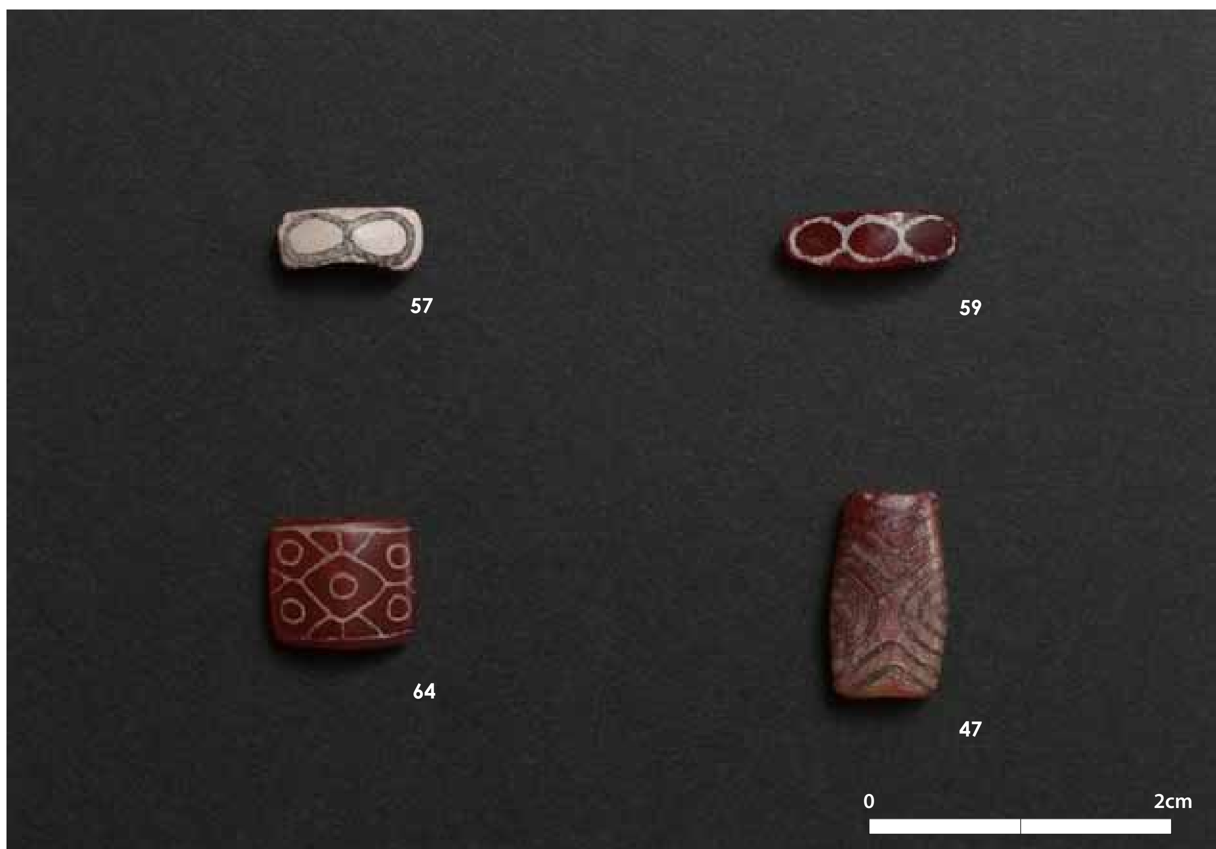


Figure 7.98 Stone beads (2:1)

1. Seven specimens are included in this type (not illustrated). They measure from 3.86 mm to 5.79 mm in diameter and from 1.07 mm to 2.72 mm in height. The perforation is done by a pecking technique.

The etched/bleached carnealian beads can be divided as follows.

	Plan	Eleveation
Type 1	circular	truncated biconical
Type 5	circular	truncated globular
Type 9	lenticular	truncated biconical
Type 10	lenticular	oblong
Type 11	lenticular	circular
Type 12	lenticular	square

[Types 1 and 5]

Only three specimens of etched/bleached carnelian beads are identified as belonging to Type 1 (St-45, St-85, St-86). The formal features are identical with those of the plain carnelian beads of Type 1. They measure from 4.3 mm to 4.37 mm in diameter and from 2.01 mm to 2.06 mm in height. They are covered by a bleached surface of a white colour. The perforation is done by a pecking technique.

Type 5 is represented by one specimen (St-46) which has a white band in the centre of the body.

[Type 9]

This type is represented by only one specimen (St-47). The central ridge of the bead is slightly off-centre. It measures 6.63 mm in width, 4.33 mm in thickness and 13.48 mm in height. The bleached pattern consists of concentric semicircles and multiple V-shaped lines.

[Type 10]

This type is represented by 15 specimens (St-48 - St-60, St-88), and is the most common of the etched/bleached beads. Among the total number, seven specimens are complete and the rest are fragments. They measure 4.17 mm to 11.95 mm in width, 2.81 mm to 5.81 mm in thickness and 2.05 mm to 7.63 mm in height. The bleached design consists of one to three circles.

[Type 11]

Type 11 is represented by four specimens (St-61 - St-63), of which only one is complete. The one complete specimen measures 7.99 mm in width. These beads including frangments measure from 3.86 mm to 4.0 mm in thickness and from 6.97 mm to 11.41 mm in height. The bleached design is a circular band around the edge.

[Type 12]

This type is represented by only one specimen (St-64). It measures 9.58 mm in width, 4.17 mm in thickness and 8.65 mm in height. An intricate design consisting of oblique lines that make a polygonal design and circles arranged in spaces between oblique lines, is depicted on both sides..

In terms of the spatial and stratigraphic distribution (Tables 7.20 - 7.34), most of the beads were found in Phase 5 of the Central Area, followed by Phase 4 of the East Area, Phase 2 of the Northwest Area, and Phase 4 of the North Area. This pattern is commonly observed in typological distribution. In the Central Area, they occur in Phases 1 to 4 as well, although in a limited number. The etched/bleached carnelian beads show the same pattern of distribution which is dominated by Phase 5 of the Central Area. They occur in Phase 2 of the Central Area as well.

Agate beads

(Figure 7.99 - 7.100, Table 7.35)

Six specimens of agate beads were found in the excavations. They can be classified into the following types.

Type 3	circular	long barrel
Type 13	lenticular	truncated biconical

Five specimens of Type 3 (St-91 - St-95) and one specimen of Type 13 were identified (St-96). Type 3 show a range from 5.38 mm to 10.68 mm in diameter and from 9.23 mm to 15.13 mm in height. One specimen of Type 13 measures 8.66 cm in width, 3.97 mm in thickness and 9.58 mm in height.

All specimens are perforated by the drilling technique.

Five specimens come from the Central Area (Phase 5) and one specimen from the East Area (Phase 4).

Jasper beads

(Figure 7.99, 7.101 - 7.104)

Twenty-two specimens of jasper beads were found in the excavations. In those beads grouped here as jasper beads includes eight specimens possibly of kaolinite (St-99, St - 101, St-107 - St-109, St-120). One specimen (St-105) may be of serpentine. A long barrel bead (St-110) is made of a colourful piece of orbicular jasper which seems not to be derived from Gujarat (R. Law: personal communication in 2011).

They can be classified into the following types.

Type 2	circular	cylindrical
Type 3	circular	long barrel
Type 4	circular	short barrel
Type 5	circular	truncated globular
Type 8	circular	disc
Type 14	lenticular	barrel
Type 15	circular	trapezoidal

Four specimens of Type 2 were identified (St-100, St-101). They measure from 3.94 mm to 8.12 mm in diameter and from 7.47 mm to 16.85 mm in height.

Four specimens (St-103, St-105, St-110, St-111) are found in Type 3 measuring 5.80 to 15.05 mm in diameter and 9.63 mm to 49.36 mm in height. One specimen of a fragment (St-105) may be as long as St-111.

Two specimens of Type 4 (St-102, St-104) measure from 3.98 mm to 7.80 mm in diameter and from 5.54 mm to 10.90 mm in height.

Four specimens of Type 5 (St-107, St-108) were identified, measuring from 5.22 mm to 8.3 mm in diameter and from 4.49 mm to 7.04 mm in height.

Three specimens of Type 8 (St-98, St-99) were found in the excavations. They show a range of 4.50 mm to 5.70 mm in diameter and 1.67 mm to 2.49 mm in height.

Two specimens of Type 14 (St-113 - St-118) measure from 7.83 mm to 8.39 mm in width, from 6.28 mm to 7.12 mm in thickness and from 14.66 mm to 17.24 mm in height.

Type 15 was identified with one specimens (St-112) measuring 6.46 mm to 7.9 mm in width, 4.57 mm to 6.37 mm in thickness and 7.84 mm to 12.38 mm in height. Only one specimen represents Type 16 having a max diameter of 7.74 mm and a height of 8.01 mm in height.

19 specimens were found in the Central Area (Phase 5) and three specimens in the East Area (Phase 4).

Chalcedony beads

(Figure 7.101)

Five specimens of chalcedony beads of milky white colour were identified (St-123 - St-127). Some of them may be of quartz.

In shape, four specimens (St-124 - St-127) are truncated globular and one (St-123) is short cylindrical. Those beads of the former type measure from 4.03 mm to 6.08 mm in diameter and from 3.76 mm to 5.63 mm in height.

Two specimens come from the Central Area (Phase 5), two from the East Area (Phase 4) and one from the Northwest Area (Phase 2).

Steatite beads

(Figure 7.106 - 7.109, Tables 7.36 - 7.40)

3671 specimens of steatite beads were unearthed in the excavations. All specimens are white in colour, indicating that they were fired at a high temperature in the process of manufacture.

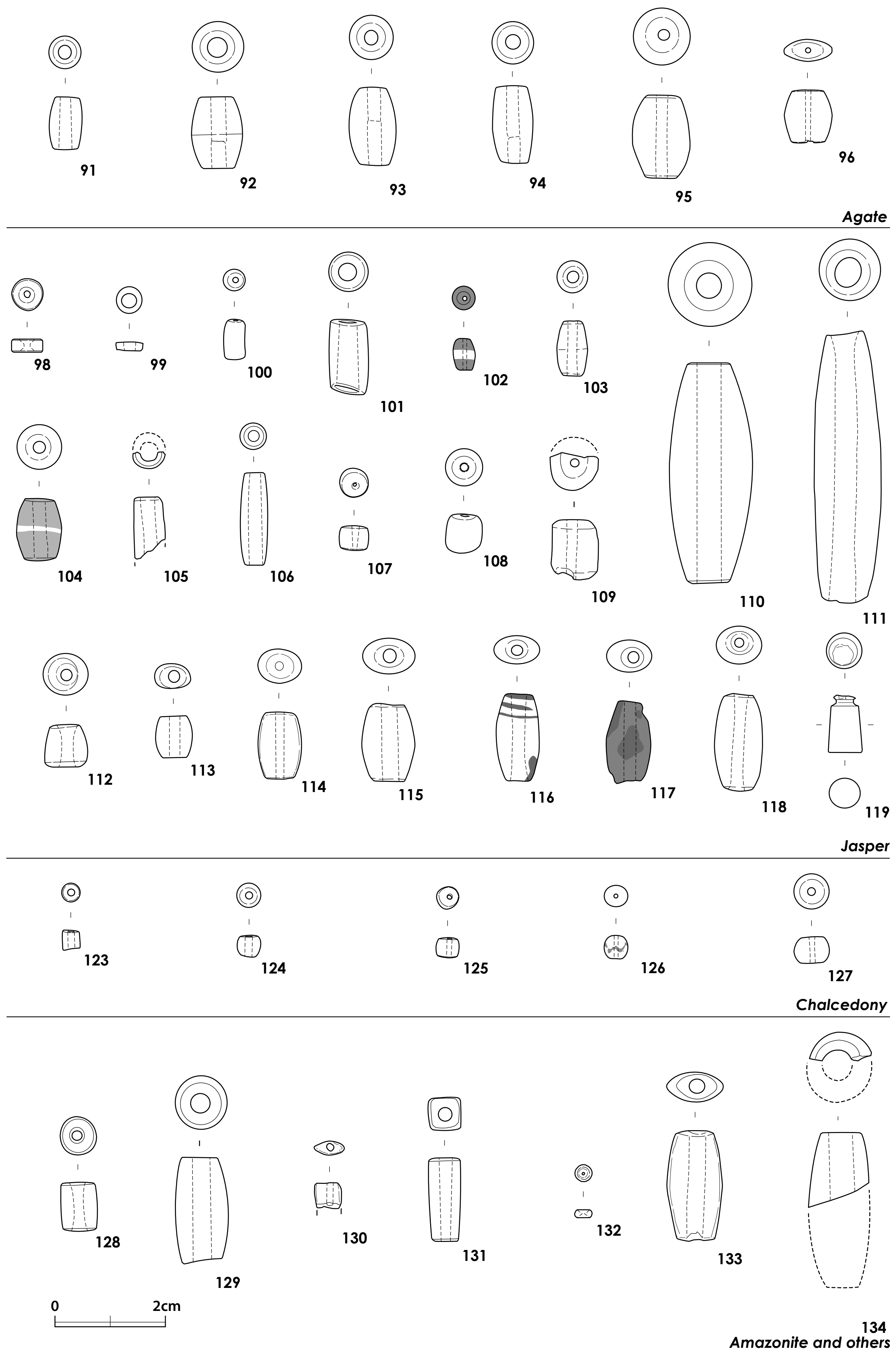


Figure 7.99 Amazonite and other stone beads (1:1)



Figure 7.100 Stone beads (2:1)



Figure 7.101 Stone beads (2:1)



Figure 7.102 Stone beads (2:1)



Figure 7.103 Stone beads (2:1)



Figure 7.104 Stone beads (2:1) (For F-38, see the section of the faience beads)



Figure 7.105 Stone beads (2:1)

Among the total number of 3671 specimens, 3254 specimens are complete. Based on these complete specimens, the beads measure 1.25 mm to 13.91 mm in diameter and 0.02 mm to 15.7 mm in height. Table 7.19 shows a size distribution in 1 mm classes, exhibiting that while a large number occurs in D (diameter) class 1 - 4/H (height) class 1 - 3, a fair number also fit into D class 1 - 2 / H class 4 - 15 and D class 5 - 13 / H class 1 - 2. Based on this distribution, the steatite beads can be classified into three shapes, i.e. those with small diameter and small height, those with large diameter and small height and those with small diameter and large height. Figure 7.111 exhibits the ratio of height/diameter.

	D (mm)	H (mm)	H/D	no.
Short cylindrical	1.25 - 6.11	2.56 - 5.0	0.5-1.5	961
Disc-shaped	1.44 - 13.91	0.02 - 3.78	0.1-0.5	2012

Table 7.19 Relations between D classes and H classes of steatite beads

			Diameter Class												
		Total	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Height Class	**1**	1269	30	977	93	74	32	18	3	8	6	4	9	10	5
	2	1535	63	1205	190	54	13	0	1	3	2	1	1	2	0
	3	168	13	105	24	19	2	0	0	0	1	2	2	0	0
	4	18	8	7	0	1	0	0	0	0	0	1	1	0	0
	5	13	6	6	0	0	0	1	0	0	0	0	0	0	0
	6	38	10	27	0	1	0	0	0	0	0	0	0	0	0
	7	27	3	25	0	0	0	0	0	0	0	0	0	0	0
	8	39	0	38	1	0	0	0	0	0	0	0	0	0	0
	9	56	3	53	0	0	0	0	0	0	0	0	0	0	0
	10	39	2	36	0	1	0	0	0	0	0	0	0	0	0
	11	23	0	22	1	0	0	0	0	0	0	0	0	0	0
	12	15	0	15	0	0	0	0	0	0	0	0	0	0	0
	13	13	1	10	1	0	0	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15	1	0	1	0	0	0	0	0	0	0	0	0	0	0
	Total	3254	139	2527	310	150	47	19	4	11	9	8	13	12	5

Long cylindrical	1.29 - 5.02	2.13 - 15.7	1.5-	281

D: diameter, H: Height

Disc-shaped beads (St-140 - St-145, St-174 - St-191) are dominant among the three types, and come in various sizes. Short cylindrical beads (St-135) are the second largest category, followed by long cylindrical beads (St-148 - St-156). One specimen (St-157) is distinguished by its rectangular plan.

Among the disc-shaped beads, nine (St-158 - St-167) are engraved with concentric circles on both sides. These specimens are distinguished by the presence of a horizontal perforation in addition to the vertical perforation. As opposed to other specimens of the disc-shaped beads, the horizontal perforations may have been used for threading a string. Six specimens of these are coated with a thin greenish glaze. They measure 9.74 mm to 12.1 mm in diameter and 2.34 mm to 3.78 mm in thickness.

Of the long cylindrical beads, 17 specimens are glazed in the same colour as that of the disc beads with concentric circles.

As shown in Table 7.36, the Central area yields the largest number of steatite beads, followed by the East Area (370 specimens), the North Area (64 specimens), the North Extension (47 specimens).In the Central Area, Phase 5 yields the largest number, though they also occur in Phases 1 - 4 in a limited number. Those from the East Area are assigned to Phase 4, while in the North Extension 12 specimens are assigned to Phase 1, one to Phase 2, 23 to Phase 3 and 11 to Phase 4. From the North Area one specimen belongs to Phase 2, 39 specimens to Phase 3 and 24 specimens to Phase 4. Of the 52 specimens from the Northwest Area, 13 specimens occur in Phase 2 and 39 specimens were found in a dump.

In terms of type, the disc-shaped beads with concentric circles occur only in Phases 4 and 5, whereas the short cylindrical beads and disc-shaped beads show a distribution pattern similar to that of the total number.

Painted steatite beads

(Figure 7.106, 7.110)

Six specimens of painted steatite beads (St-168 - St-173) were found in the excavations. They are distinguished by lenticular plans and an oblong sides which are identical to a type of etched carnelian beads. The painting is executed in a reddish brown colour, probably imitating the colour of carnelian. The white-painted patterns consist of two types, i.e. circular or oblong around the edge in five specimens

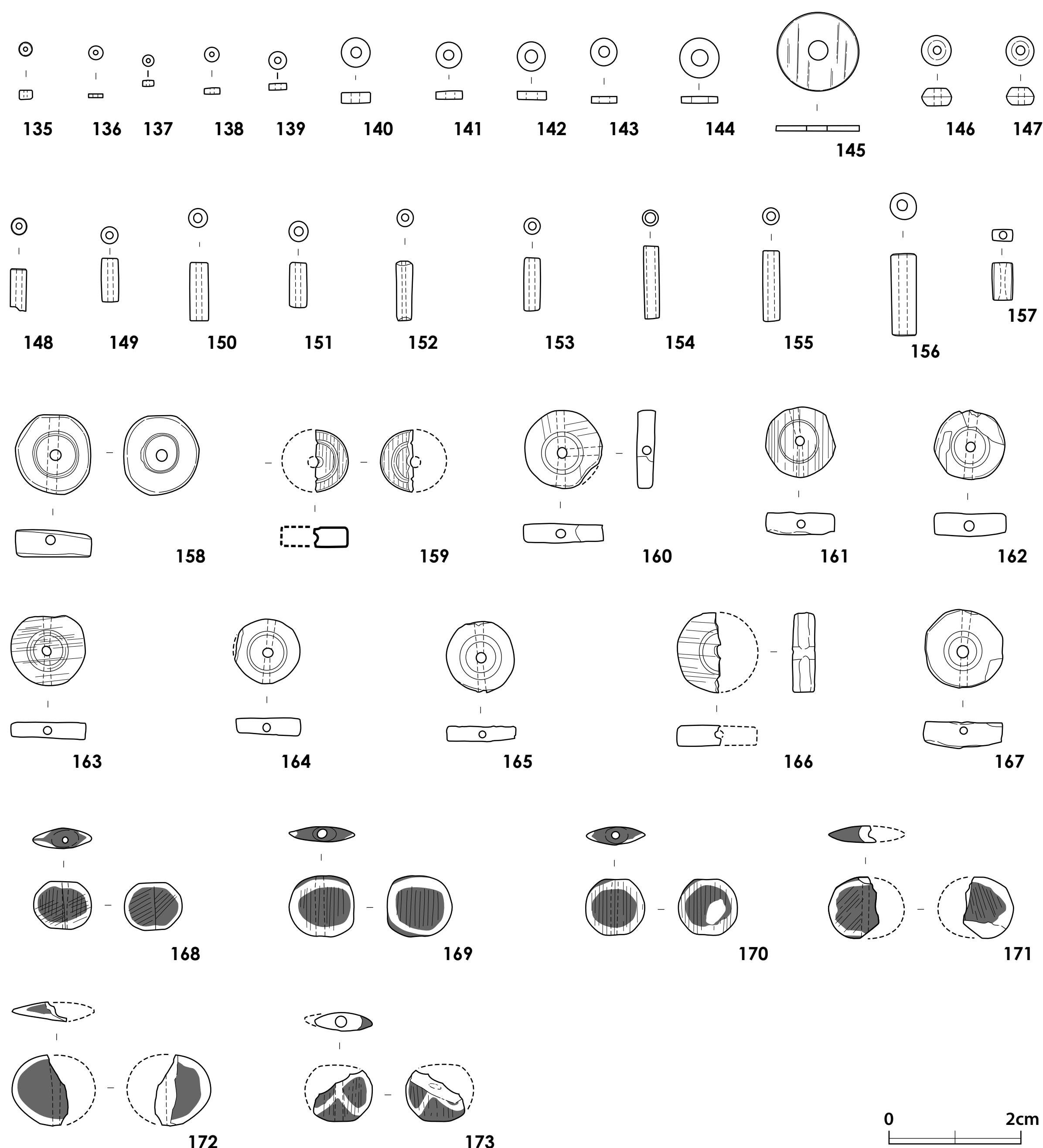


Figure 7.106 Steatite beads (1:1)

(St-168 - St-172) and ∞-shaped in one specimen (St-173).

All the specimens come from the Central Area (Phase 5).

Amazonite beads

(Figures 7.99, 7.105, Table 7.41)

Only four specimens of amazonite beads were retrieved from the excavations. They show a formal variation. St-130 has a lenticular plan measuring 5.0 mm in width, 2.8 mm in thickness and 4.9 mm in intact height. St-128 exhibits a short cylindrical shape measuring 3.85 mm in diameter and 6.58 mm in height. St-129 has a long-barrel shape that measures 9.31 mm in diameter and 19.08 mm in height. St-131 is rectangular-parallelpiped measuring 5.84 mm in length, 5.50 mm in width and 15.06 mm in height. Thus it is noteworthy that the amazonite beads come in shapes which are not seen in other stone beads.

St-130 and St-129 belong to Phase 5 of the Central

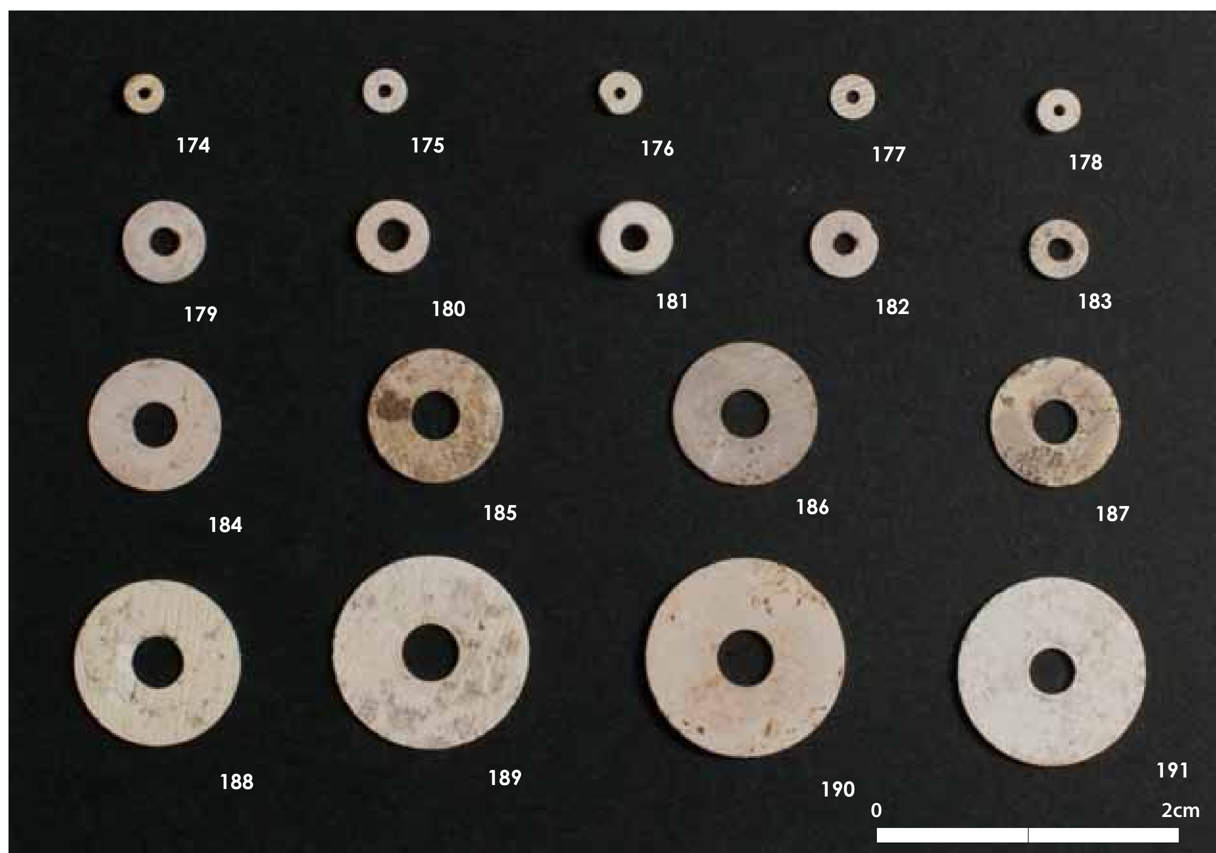


Figure 7.107 Stone beads (2:1)



Figure 7.108 Stone beads (2:1)

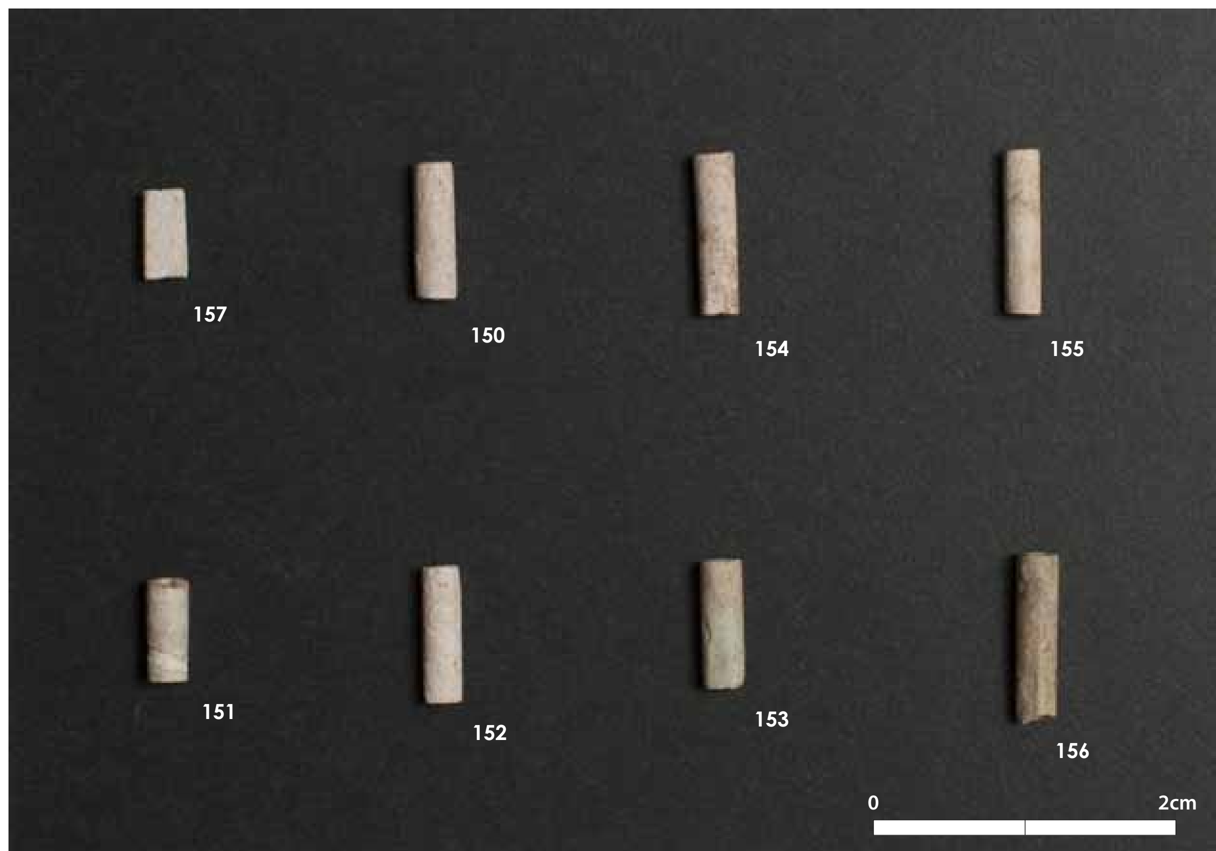


Figure 7.109 Stone beads (2:1)



Figure 7.110 Stone beads (2:1)

All variety of stones

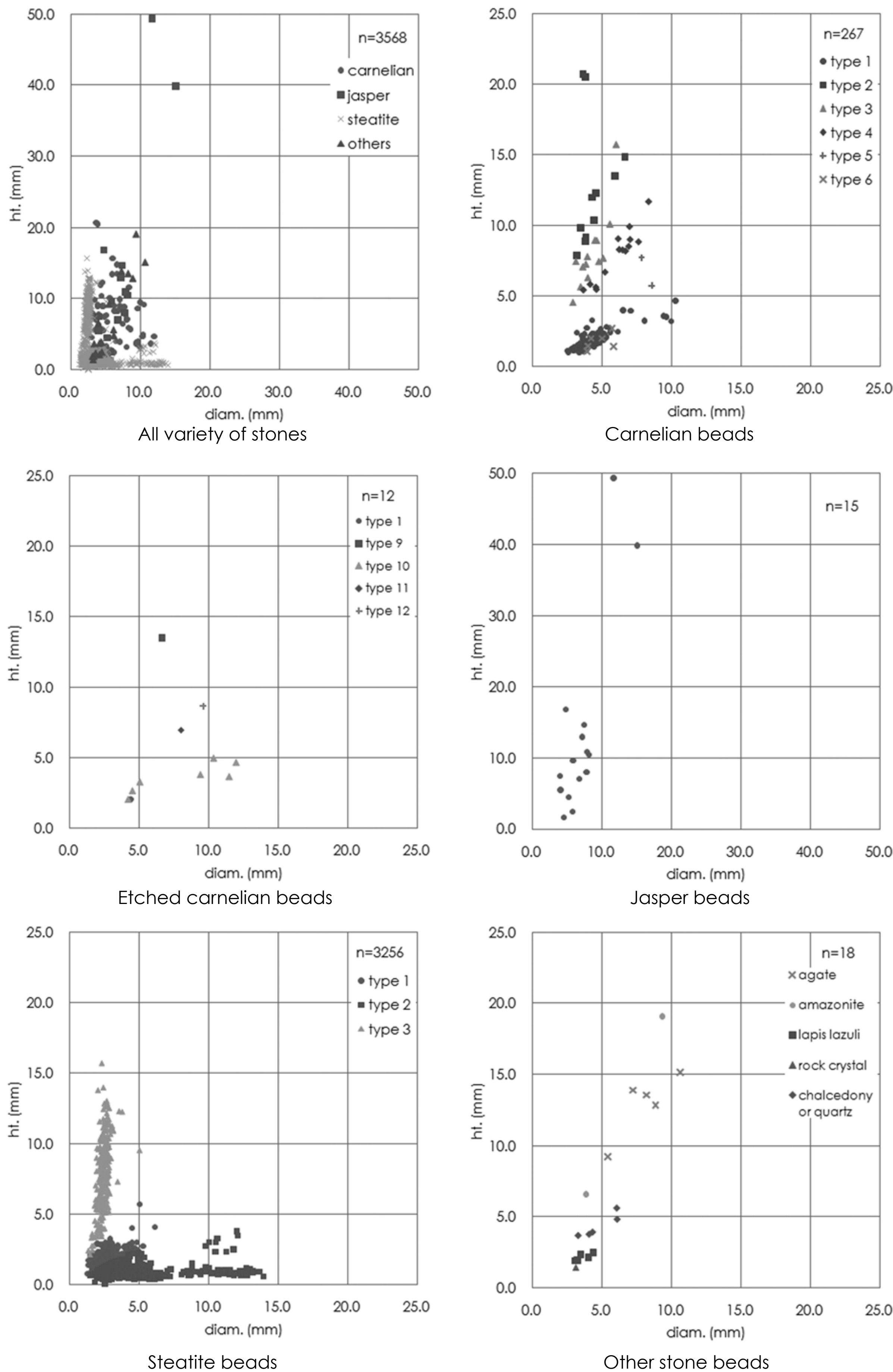


Figure 7.111 Size distribution of stone beads

Table 7.20 Area-wise stratigraphic distribution of carnelian beads (all types)

	Total	***Central Area***	***East Area***	***West Area***	***Northwest Area***	***North Extension***	***North Area***	***Kiln Area***	***Surface***
Surface	2	0	0	0	0	0	0	0	2
Phase 5	266	266	0	0	0	0	0	0	0
Phase 4	33	1	26	0	0	1	5	0	0
Phase 3	4	2	0	0	0	0	2	0	0
Phase 2	9	1	0	0	8	0	0	0	0
Phase 1	1	0	0	0	0	1	0	0	0
Uncertain	11	0	0	0	11	0	0	0	0
Total	326	270	26	0	19	2	7	0	2

Table 7.21 Area-wise stratigraphic distribution of carnelian beads (Type 1)

	Total	***Central Area***	***East Area***	***West Area***	***Northwest Area***	***North Extension***	***North Area***	***Kiln Area***	***Surface***
Surface	0	0	0	0	0	0	0	0	0
Phase 5	191	191	0	0	0	0	0	0	0
Phase 4	22	1	16	0	0	1	4	0	0
Phase 3	4	2	0	0	0	0	2	0	0
Phase 2	5	0	0	0	5	0	0	0	0
Phase 1	1	0	0	0	0	1	0	0	0
Uncertain	5	0	0	0	5	0	0	0	0
Total	228	194	16	0	10	2	6	0	0

Table 7.22 Area-wise stratigraphic distribution of carnelian beads (Type 2)

	Total	***Central Area***	***East Area***	***West Area***	***Northwest Area***	***North Extension***	***North Area***	***Kiln Area***	***Surface***
Surface	1	0	0	0	0	0	0	0	1
Phase 5	16	12	4	0	0	0	0	0	0
Phase 4	1	0	0	0	0	0	1	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	1	0	0	0	1	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	19	12	4	0	1	0	1	0	1

Table 7.23 Area-wise stratigraphic distribution of carnelian beads (Type 3)

	Total	***Central Area***	***East Area***	***West Area***	***Northwest Area***	***North Extension***	***North Area***	***Kiln Area***	***Surface***
Surface	1	0	0	0	0	0	0	0	0
Phase 5	12	12	0	0	0	0	0	0	0
Phase 4	2	0	2	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	1	0	0	0	1	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	1	0	0	0	1	0	0	0	0
Total	17	12	2	0	2	0	0	0	1

Table 7.24 Area-wise stratigraphic distribution of carnelian beads (Type 4)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	12	12	0	0	0	0	0	0	0
Phase 4	2	0	2	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	1	0	0	0	1	0	0	0	0
Total	15	12	2	0	1	0	0	0	0

Table 7.25 Area-wise stratigraphic distribution of carnelian beads (Type 5)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	2	2	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	2	2	0	0	0	0	0	0	0

Table 7.26 Area-wise stratigraphic distribution of carnelian beads (Type 6)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	6	6	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	6	6	0	0	0	0	0	0	0

Table 7.27 Area-wise stratigraphic distribution of carnelian beads (Type 7)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	1	1	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	1	1	0	0	0	0	0	0	0

Table 7.28 Area-wise stratigraphic distribution of carnelian beads (Type 8)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	6	6	0	0	0	0	0	0	0
Phase 4	1	0	1	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	7	6	1	0	0	0	0	0	0

Table 7.29 Area-wise stratigraphic distribution of etched carnelian beads (all types)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	19	19	0	0	0	0	0	0	0
Phase 4	1	0	1	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	2	1	0	0	1	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	3	0	0	0	3	0	0	0	0
Total	25	20	1	0	4	0	0	0	0

Table 7.30 Area-wise stratigraphic distribution of etched carnelian beads (Type 1)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	3	3	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	3	3	0	0	0	0	0	0	0

Table 7.31 Area-wise stratigraphic distribution of etched carnelian beads (Type 9)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	1	1	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	1	1	0	0	0	0	0	0	0

Table 7.32 Area-wise stratigraphic distribution of etched carnelian beads (Type 10)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	10	10	0	0	0	0	0	0	0
Phase 4	1	0	1	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	2	1	0	0	1	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	2	0	0	0	2	0	0	0	0
Total	15	11	1	0	3	0	0	0	0

Table 7.33 Area-wise stratigraphic distribution of etched carnelian beads (Type 11)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	4	4	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	4	4	0	0	0	0	0	0	0

Table 7.34 Area-wise stratigraphic distribution of etched carnelian beads (Type 12)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	1	1	0	0	0	0	0	0	0
Phase 4	0	0	0	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	1	1	0	0	0	0	0	0	0

Table 7.35 Area-wise stratigraphic distribution of agate beads (all types)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	5	5	0	0	0	0	0	0	0
Phase 4	1	0	1	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	6	5	1	0	0	0	0	0	0

Table 7.36 Area-wise stratigraphic distribution of steatite beads (all)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	7	0	0	0	0	0	0	0	7
Phase 5	3051	3051	0	0	0	0	0	0	0
Phase 4	408	3	370	0	0	11	24	0	0
Phase 3	78	16	0	0	0	23	39	0	0
Phase 2	32	17	0	0	13	1	1	0	0
Phase 1	43	31	0	0	0	12	0	0	0
Uncertain	52	1	0	12	39	0	0	0	0
Total	3671	3119	370	12	52	47	64	0	7

Table 7.37 Area-wise stratigraphic distribution of steatite beads (short cylindrical)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	816	816	0	0	0	0	0	0	0
Phase 4	94	1	84	0	0	4	5	0	0
Phase 3	17	4	0	0	0	5	8	0	0
Phase 2	6	2	0	0	3	0	1	0	0
Phase 1	12	7	0	0	0	5	0	0	0
Uncertain	16	0	0	4	12	0	0	0	0
Total	961	830	84	4	15	14	14	0	0

Table 7.38 Area-wise stratigraphic distribution of steatite beads (disc-shaped)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	3	0	0	0	0	0	0	0	3
Phase 5	1660	1660	0	0	0	0	0	0	0
Phase 4	272	2	248	0	0	7	15	0	0
Phase 3	38	7	0	0	0	15	16	0	0
Phase 2	14	6	0	0	8	0	0	0	0
Phase 1	30	24	0	0	0	6	0	0	0
Uncertain	30	1	0	5	24	0	0	0	0
Total	2047	1700	248	5	32	28	31	0	3

Table 7.39 Area-wise stratigraphic distribution of steatite beads (disc-shaped with concentric circles)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	7	7	0	0	0	0	0	0	0
Phase 4	2	0	1	0	0	0	1	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	9	7	1	0	0	0	1	0	0

Table 7.40 Area-wise stratigraphic distribution of steatite beads (long cylindrical)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	259	236	23	0	0	0	0	0	0
Phase 4	3	0	0	0	0	0	3	0	0
Phase 3	11	0	0	0	0	3	8	0	0
Phase 2	4	2	0	0	1	1	0	0	0
Phase 1	1	0	0	0	0	1	0	0	0
Uncertain	3	0	0	1	2	0	0	0	0
Total	281	238	23	1	3	5	11	0	0

Table 7.41 Area-wise stratigraphic distribution of amazonite beads

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	2	2		0	0	0	0	0	0
Phase 4	2	0	2	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	4	2	2	0	0	0	0	0	0

Table 7.42 Area-wise stratigraphic distribution of lapis lazuli beads

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	2	2	0	0	0	0	0	0	0
Phase 4	2	0	1	0	0	0	1	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	1	0	0	0	1	0	0	0	0
Total	5	2	1	0	1	0	1	0	0

Area, while St-128 and St-131 belong to Phase 4 of the East Area.

Lapis lazuli bead

(Table 7.42)

Five specimens of lapis lazuli bead were identified. It should be specially mentioned that there are some specimens of faience beads, which show a colour similar to that of lapis lazuli, making it difficult to distinguish them from lapis lazuli beads in the case of tiny beads.

All specimens of the lapis lazuli beads are short cylindrical in shape, measuring 3.03 mm to 4.36 mm in diameter and 1.91 mm to 2.50 mm in height.

Two specimens belong to the Central Area (Phase 5), and one each to the East Area (Phase 4), the Northwest Area (a dump) and the North Area (Phase 4).

Limestone bead

Only one specimen (St-133) may represent a limestone bead (?). It is tan-grey in colour. In shape it is of long barrel from side with a lenticular plan. It measures 10.61 mm in width, 5.17 mm in thickness and 19.58 mm in height. This was found in the Central Area (Phase 5).

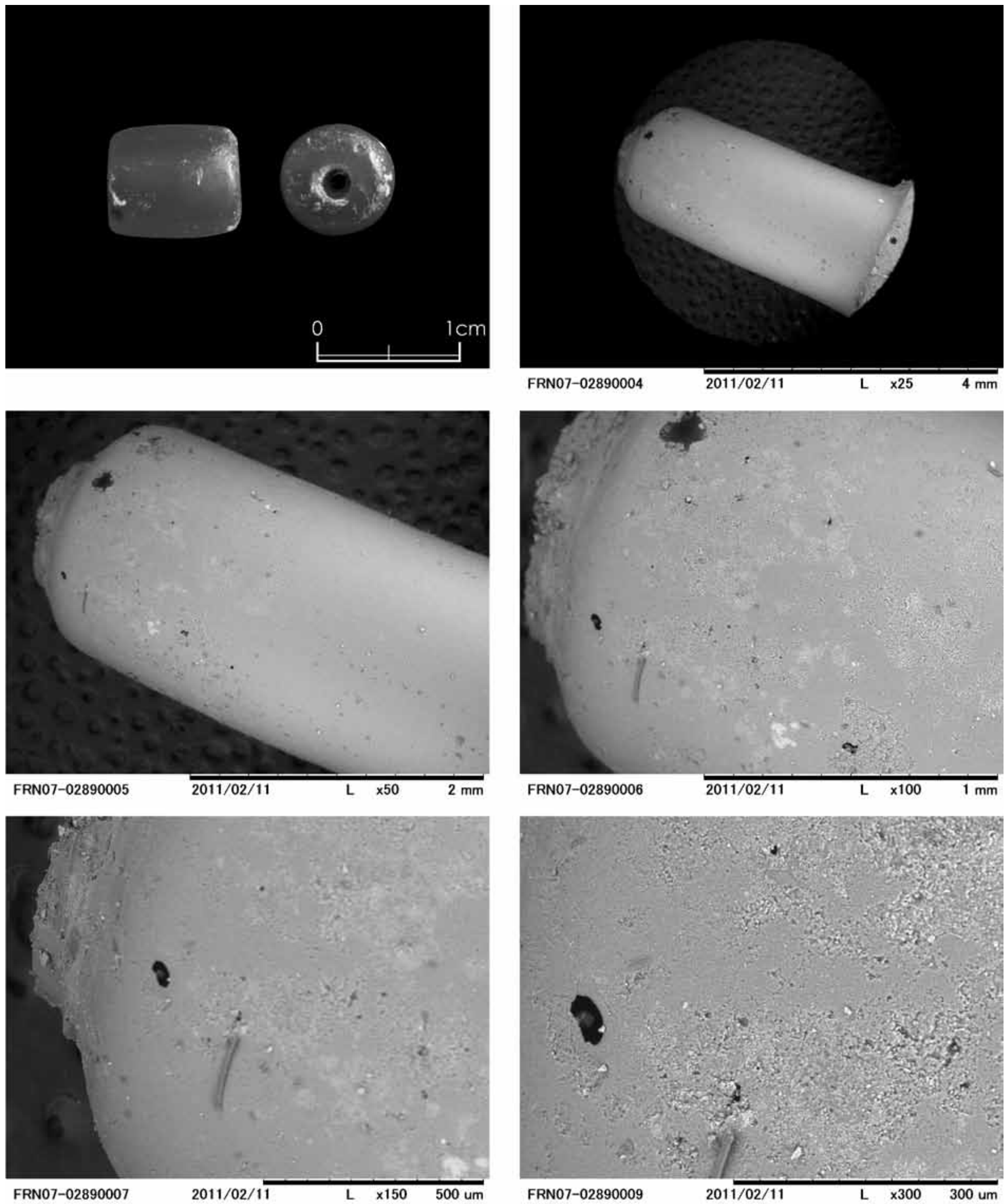
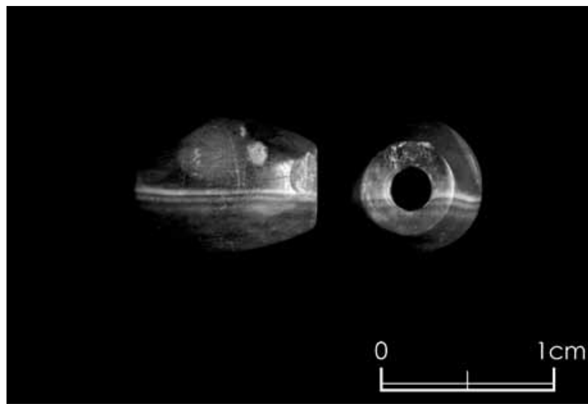
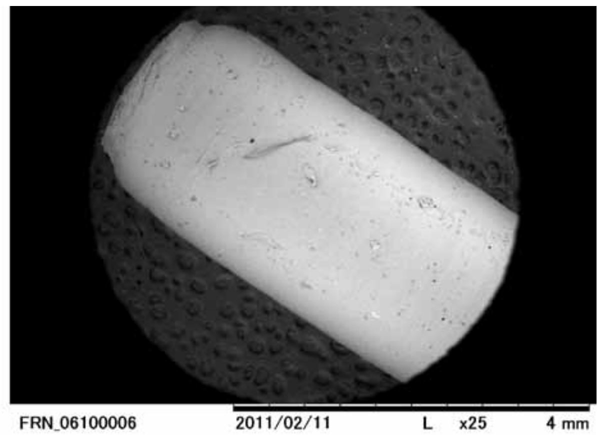
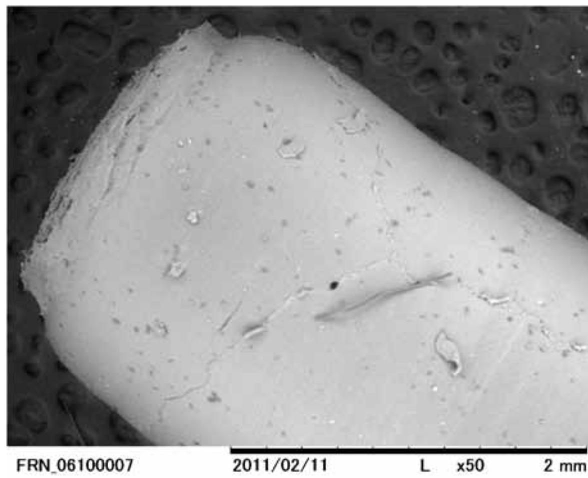
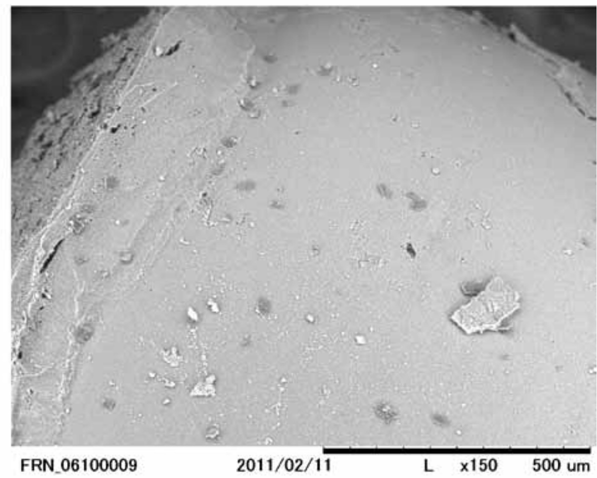


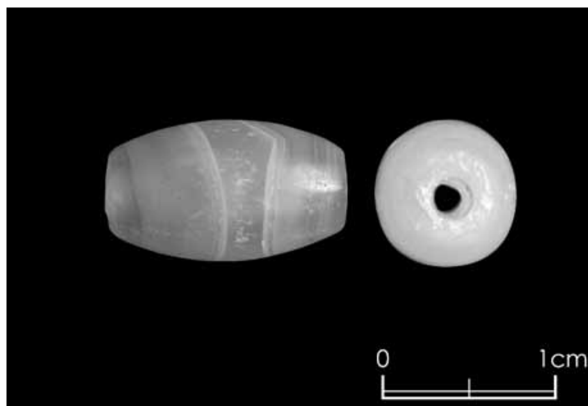
Figure 7.112 SEM image of silicon impression of a perforation of carnelian beads (St-82)

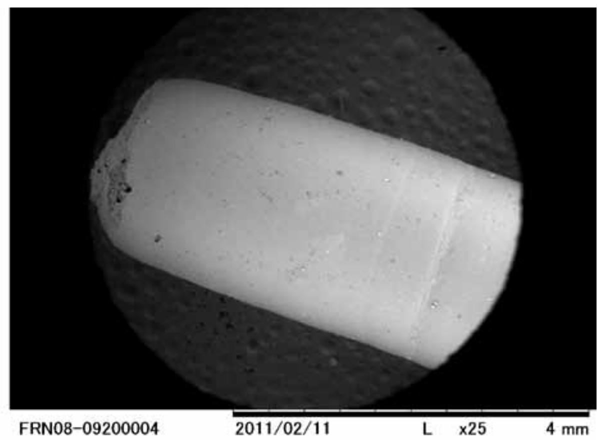


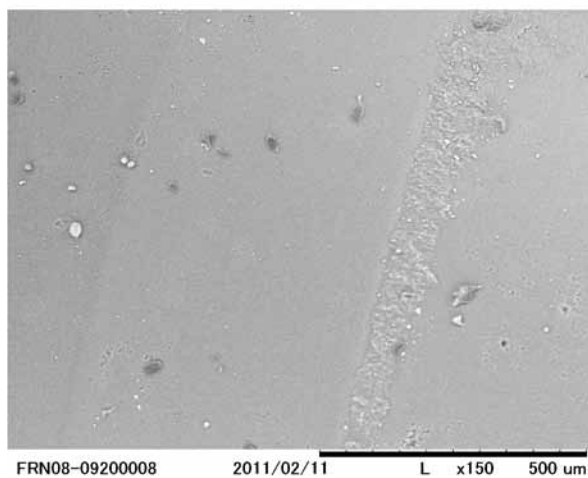












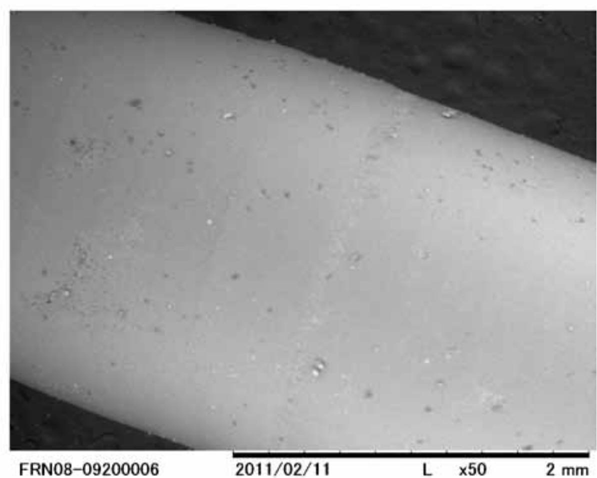


Figure 7.113 SEM image of silicon impression of a perforation of carnelian beads (St-90 and St-93)

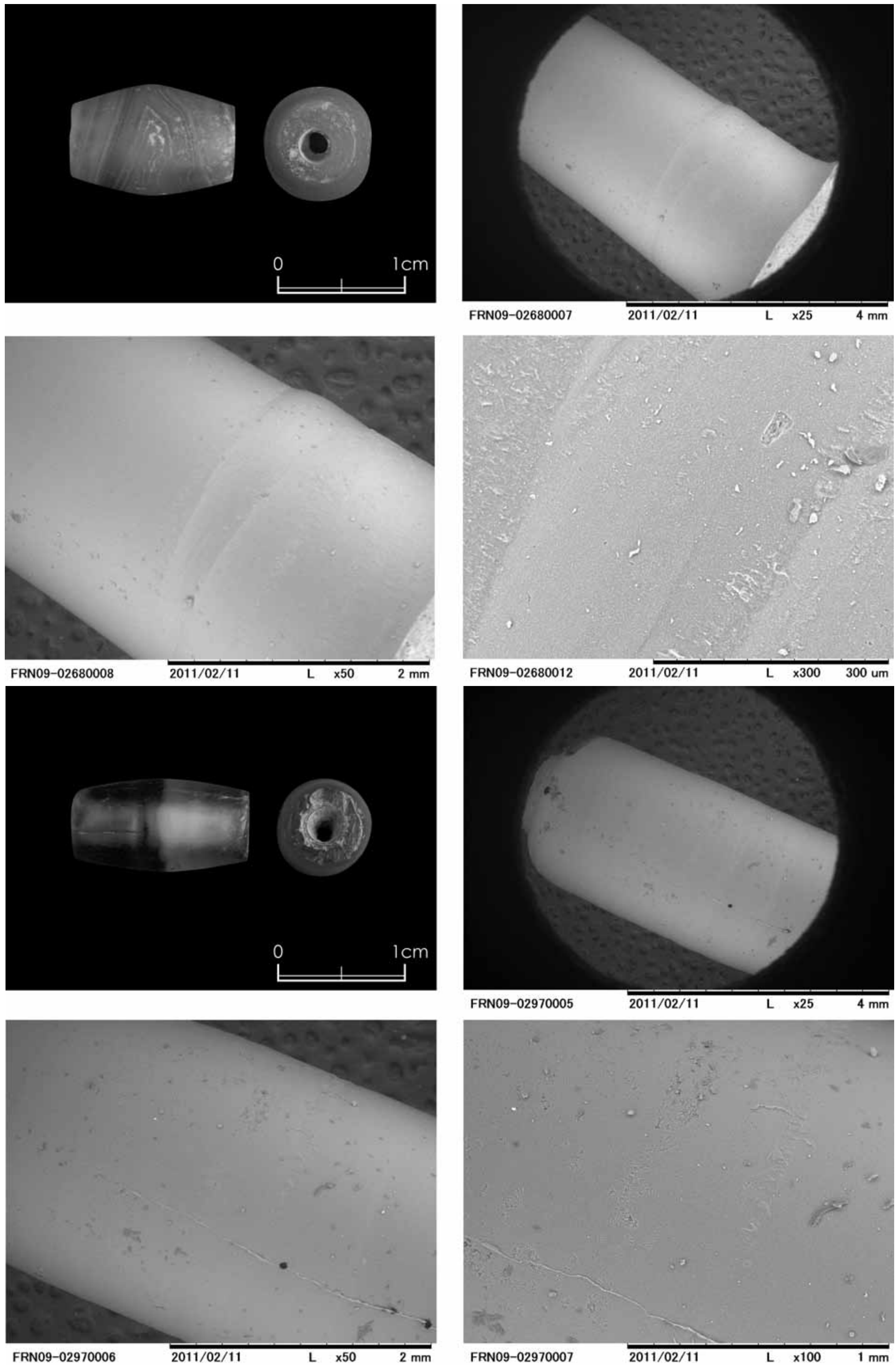


Figure 7.114 SEM image of silicon impression of a perforation of agate bead (St-92 and St-94)

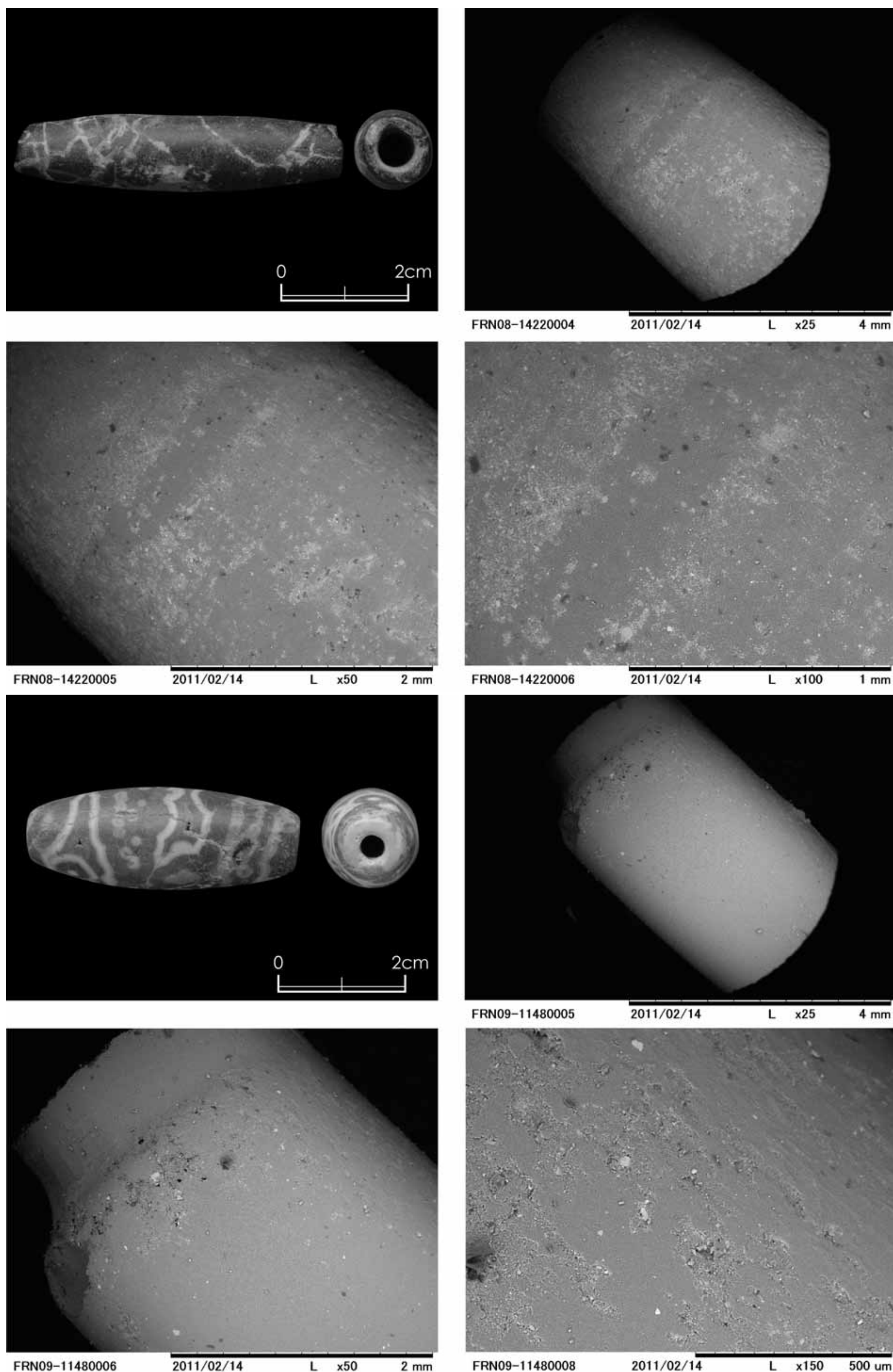


Figure 7.115 SEM image of silicon impression of a perforation of agate bead (St-111 and St-110)

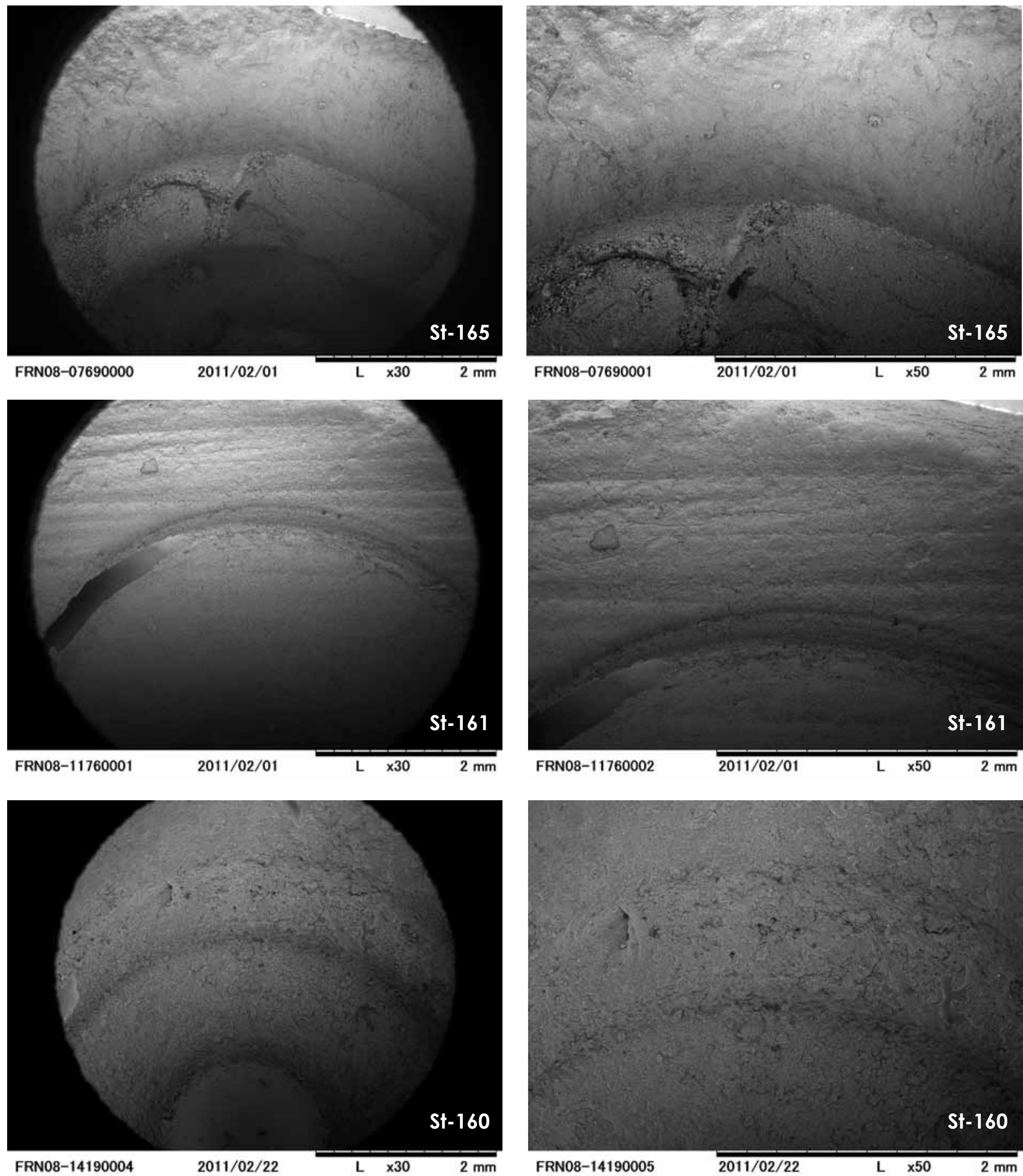


Figure 7.116 SEM image of silicon impression of a perforation of steatite beads

Comments on the SEM images of silicon-based impressions of bead holes

by J.M. Kenoyer (University of Wisconsin-Madison)

Carnelian barrel shaped bead (St-82): The slightly tapered profile of the drill hole impression of this bead reveals the use of a tapered cylindrical stone drill or a worn constricted cylindrical drill (Kenoyer and Vidale 1992). The drill hole surface is very smooth as a result of the drilling process and there are slight circular striae indicating the use of a bow drilling technique. The tip of the drill hole impression is rounded which is generally characteristic of a jasper or chert drill, though this can sometimes result from the use of a worn or tapering Ernestite drill as well. Due to the short length of the bead, it appears that only one size of drill was used to perforate the bead from each side. The tips of the dill holes are perfectly aligned and meet to form a tiny hole. The point where the drill tips meet is relatively rough, indicating that this bead may have been strung on a fine string for only a short time before the string was cut through by the rough and jagged edge left where the drilling perforated the center of the bead. The exterior of the bead is smooth with low luster polish, and the ends of the bead do not appear highly polished. These features suggest that the bead was used for a relatively short time before it was lost and became deposited in the archaeological record.

Banded agate-carnelian or jasper. barrel shaped bead (St-90): This bead is perforated with a stone drill that is probably of the constricted cylindrical variety based on the straight cylindrical profile of the drill hole(Kenoyer and Vidale 1992). Due to the hardness of this stone, it is not unlikely that this bead was drilled with an Ernestite drill or some form of jasper that was significantly harder than the bead material. The distinct circular striae visible on the drill hole surface indicate that the drill was turned with a bow mechanism and the drill bit itself was cutting the surface of the bead along with tiny chips of the drill bit or broken chips of the bead. The surface of the drill hole is highly polished as the tiny chips are broken into fine powder and eventually removed as a slurry. The drilling was accomplished using a single long drill from each side, and the drill holes are perfectly aligned. The stepped portion in the center of the drill hole indicates the use of a smaller drill bit from one side that cuts through and makes a smooth center drill hole. This drilled surface may also have been slightly smoothed by the string that was used to perforate the bead. The exterior surface of the bead has a high luster polish that may be the result of wear or fine polishing processes.

Banded agate barrel shaped bead (St-93): This bead has a long tapered drill hole profile, and it was probably drilled with a long tapered cylindrical drill or a series of different sizes of constricted cylindrical stone drills. The circular striae on the drill hole surface indicate that the stone drill tip was much harder than the bead material and that tiny chips of the bead or drill bit broke loose during drilling. The perforation point where the two drill holes meet is perfectly aligned but is jagged and rough, indicating that the rounded drill tip, chipped through to create the perforation. There is no indication of wear or smoothing so this bead may have been used for a relatively short period of time before the string broke and it was lost. The exterior of the bead has a low luster polish, and the ends of the bead are slightly battered, but not heavily worn from rubbing against other beads on a necklace.

Banded agate biconical bead (St-92): Based on the drill hole profile, this bead was drilled from one side with two different sizes of constricted cylindrical drills. (I do not know what the other drill hole impression looks like so I cannot describe it). The circular drilling striae indicate the use of a bow for turning the drill bit, and the rounded end and highly polished surfaces of the drill hole itself suggest the use of a hard jasper or Ernestite drill. The drill hole alignment is relatively straight, but the perforation from one side is slightly to the side and results in a hole with a very sharp edge.

Banded agate barrel bead (St-94): The drill hole profile is straight cylindrical and indicates the use of a constricted cylindrical drill tip, probably made of Ernestite. The circular striae from drilling indicate the use of a bow for turning the drill bit, and the alignment of the drill holes are perfectly matched, but leave a jagged central hole. There is no wear on the center hole from the use of a string. The exterior surface has a low luster polish and the ends of this bead show the remains of the chipped bead blank and are not heavily worn. This bead was probably used for a very short time before being lost.

Jasper long barrel bead (St-111): This bead has what appears to be a long tapered drill hole profile and was possibly drilled with a tapered cylindrical drill or a worn constricted cylindrical drill. The drill hole surface is weathered and irregular due to the composition of the bead raw material. It does not show a high polish, but is quite smooth and is the result of stone drilling. The exterior of the bead is rough and low luster polish and the ends are also still quite rough and unworn.

Banded and orbicular jasper barrel bead (St-110): The drill hole profile indicates the use of a constricted cylindrical drill, probably Ernestite. The drill hole surface shows some circular striae from the use of a bow for turning the drill. A smaller drill bit was used for drilling from the opposite side and is slightly offset from the alignment of the larger drill. There are some longitudinal striae on one side of the drill hole perforation where the two drill tips meet. This could have been the result of pressure from the drill bit as it perforated the midpoint of the bead. The opposite side of the drill hole is highly smoothed from the use of a string and the exterior surface and ends of the bead are also well smoothed. These indicators suggest that this bead was worn on a string for some time and that it was strung along with other beads that rubbed against each other to smooth the ends of the bead.

Steatite short cylindrical (disc) bead (St-165, St-161, St-160): This steatite bead appears to have been drilled with a copper drill bit, leaving distinct circular striae as it cut through the soft steatite. The parallel striae on the bead surface indicates that it was sawn using a denticulated copper/bronze saw. The technique of Indus disc bead production is well studied and documented from the sites of Mehrgarh, Mohenjo-daro and Harappa (Vidale 1989, 1995; Kenoyer 1997, 2005). The unfired steatite is sliced into thin sheets using a denticulated copper/bronze saw and the thin wafers of steatite are chipped and ground to a rough circular shape. The beads are then perforated using a copper drill and strung on a cord for final rounding. Many beads are strung together to allow the creation of beads with identical diameters or graduated diameters. During the grinding process the bead surfaces that are touching are slightly worn, but often the sawn surface is not worn completely away as is seen on this bead. After final shaping the beads are fired to harden them

References

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Rock crystal bead

One specimen of a rock crystal (St-132) bead was identified. It is represented by a truncated biconical in shape, measuring 3.11 mm in diameter and 1.42 mm in height. Thiswas recovered from the Central Area (Phase 5).

Siltstone bead

One broken specimen (St-134) possibly of a long-barrel bead was identified as of siltstone. It is of a grey colour. This piece comes from the North Extension (Phase 4).

SEM images of silicon-based impressions of perforations of beads

With helpful instructions and suggestions by Prof. J.M. Kenoyer (University of Wisconsin-Madion), silicon-based impressions of bead holes were made and microscopic observations using a SEM were attempted. Since it is premature for us to make any conclusion on the perforation technique of beads from Farmana, Prof. Kenoyer kindly wrote a note on them based on the SEM images we provided him (see pp. 469-470, Figure 7.112 - 7.116).

(Uesugi/Endo/Konasukawa)

4.3 Unfinished stone beads

(Figures 7.117 - 7.120, Tables 7.43 - 7.45)

Forty-six pieces of agate, carnelian and jasper pieces which can be considered have been used for bead production were unearthed in the excavations. Among those which the author observed, six specimens are agate and 32 specimens are carnelian. One represents a small pebble of white-banded black jasper (not illustrated). Although they vary in shapes and sizes, they are classified as unfinished beads because there is no agate and carnelian blade/bladelets assemblage at the site. Altogether there are 17 pieces of debitage and 21 specimens of unfinished beads.

The colour varies from red-translucent red (nine specimens), to orange-translucent yellow (23 specimens), translucent white (five specimens) and finally black (one specimen).

Debitage

Among 17 debitage fragments (St-192 - St-195), 12 specimens are primary flakes with a cortex in parts and five are secondary flakes with no cortex. The former may indicate that nodules were imported to the site and that primary flaking was conducted there. None of the specimens are retouched, showing that they are residues produced in the course of bead production.

Unfinished beads

The specimens of unfinished beads are classified into two types, i.e. a rectangular parallelpiped type (St-196 - St-202) and a tablet type (St-203 - St-213). They are executed with minute retouching around the edge after heating. A variety of stages of the manufacturing process can be seen in these specimens. Most of them represents roughouts, although there is one specimen which shows significant traces of grinding, representing a stage before perforation.

Those of rectangular parallelpiped types are grouped into groups that are 1 cm in height and 2 cm in height. Those of the tablet type are less than 1 cm in height. Based on comparison with finished carnelian beads, the rectangular parallelpiped types may be finally finished as long or short barrel shapes and the tablet type as runcated biconical shapes or a disc shapes of small size.

Most of the unfinished beads were found from the Central Area (Phase 5) (Tables 7.43 - 7.45). A few were found from the East Area (Phase 4).

(Endo)

4.4 Jasper pendant

(Figure 7.99)

One specimen made f dark green jasper (St-119)

Table 7.43 Area-wise stratigraphic distribution of unfinished beads (all)

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	1	0	0	0	0	0	0	0	1
Phase 5	42	42	0	0	0	0	0	0	0
Phase 4	3	0	3	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	46	42	3	0	0	0	0	0	1

Table 7.44 Area-wise stratigraphic distribution of unfinished carnelian beads

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	1	0	0	0	0	0	0	0	1
Phase 5	35	35	0	0	0	0	0	0	0
Phase 4	2	0	2	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	38	35	2	0	0	0	0	0	1

Table 7.45 Area-wise stratigraphic distribution of unfinished agate beads

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	6	6	0	0	0	0	0	0	0
Phase 4	1	0	1	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	7	6	1	0	0	0	0	0	0

was identified as a pendant which has a truncated conical shape with a notched top. It measures 6.5 mm in base diameter, 4.8 mm in diameter near the top and 10.5 mm in height. It comes from the Central Area (Phase 5).

(Uesugi)

4.4 Blade/bladelet assemblage
(Figures 7.121 - 7.127, Table 7.46)

35 specimens that belong to the tan-grey chert blade/bladelet assemblage were unearthed in the excavations. Among them 32 specimens have been documented and is described in this report.

The blades/bladelets are defined as having a length-to-width ratio of more than 2.0. The distinction between blades and bladelets is based on their length, that is, those that are longer than 1.0 cm are called blades and those that are less than 1.0 cm are termed as bladelets. All specimens of blades and bladelets are parallel-sided.

In terms of manufacturing, all the blades and bladelets are produced by a typical blade technique. One or both ends are truncated by a single percussion. Six specimens are intact with platforms and show no evidence of pressure flaking with metal hammer.

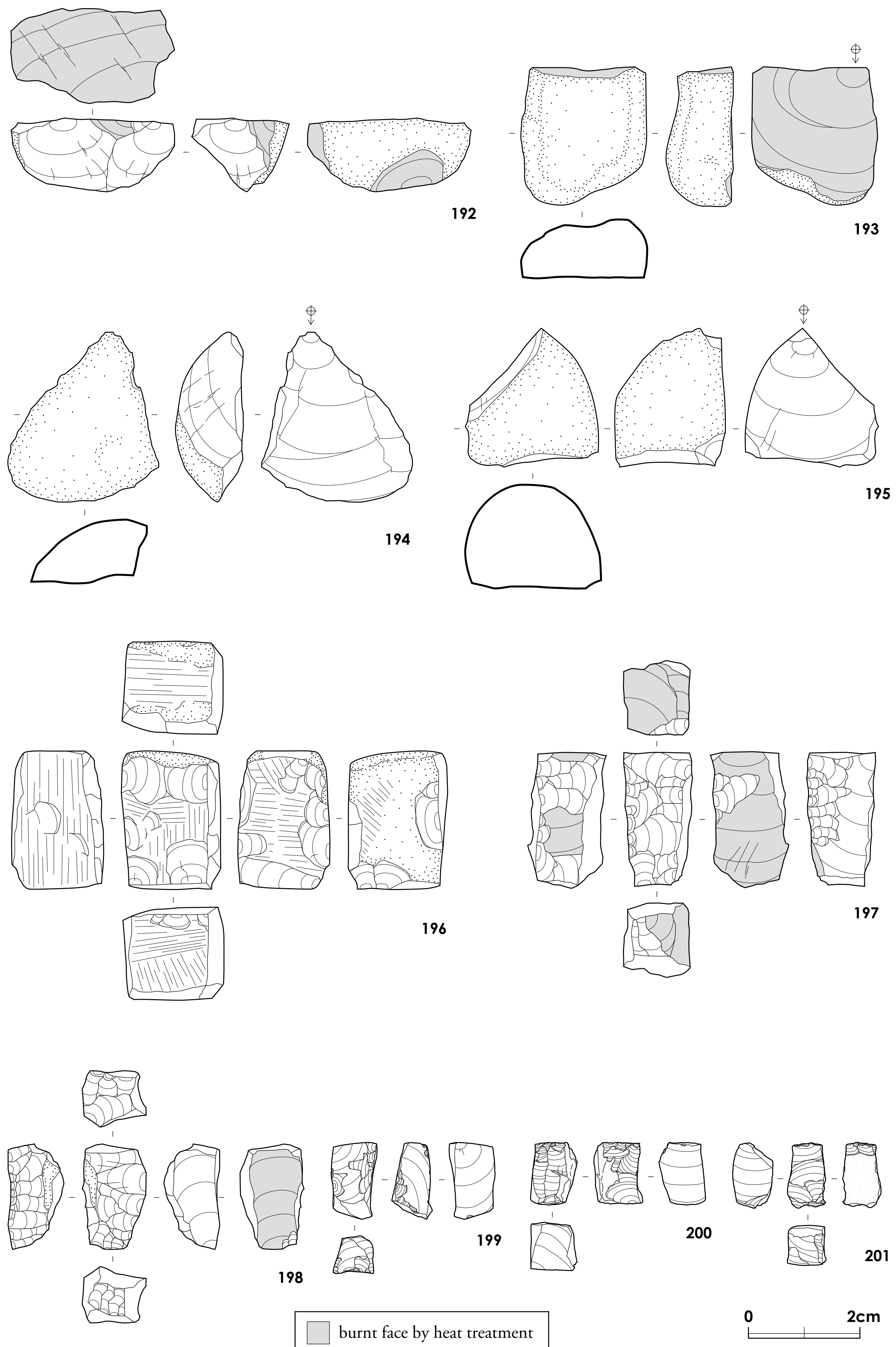


Figure 7.117 Cores, roughouts and blanks (1:1)

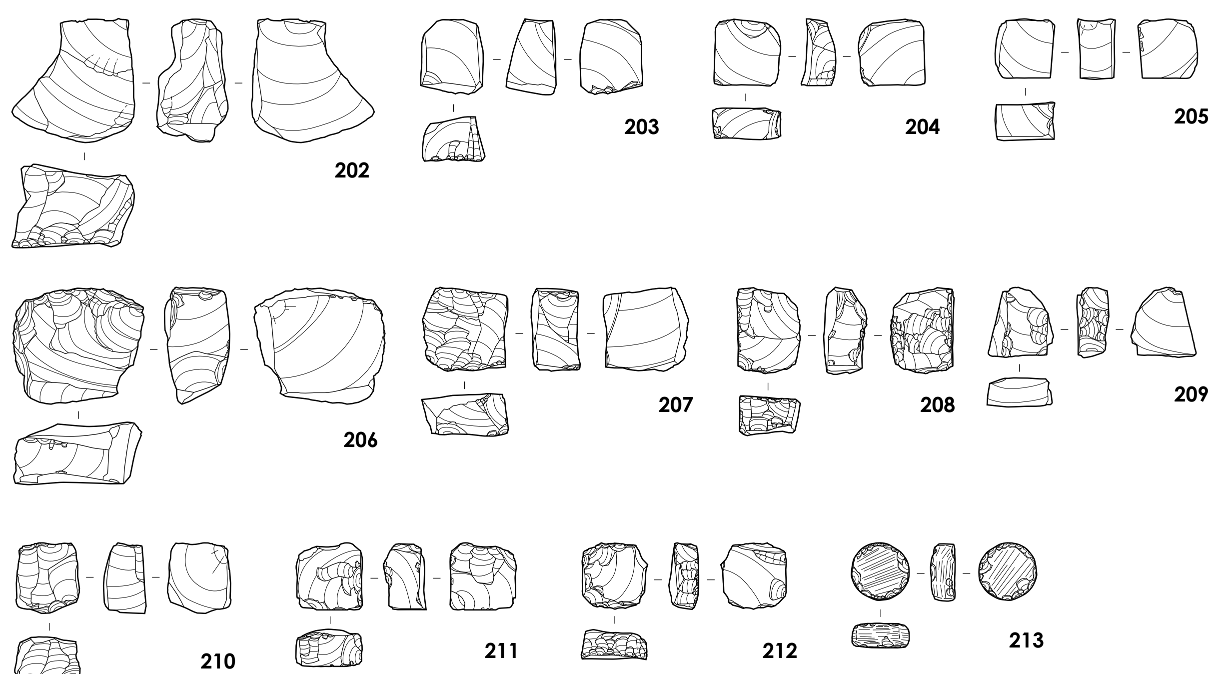


Figure 7.118 Cores, roughouts and blanks (2:1)

There are 19 specimens of tools, which can be classified as follows.

Sickle blades	13	(St- 220 - St-232)
Retouched blade	5	(St-235 - St-239)
notched blade	1	(St-234)

Of these, only sickle blades are made from both blades (10 specimens) and bladeles (three specimens).

The sickle blades show gloss created by the use for cereal cropping on the edges. They range from 0.88 cm to 7.47 cm in length, concentrating in a range of 2 cm to 3 cm. Nine of the 13 specimens were used only one side, while both sides are used in four specimens. It is noteworthy that some specimens show a rounded edge which indicates that they were heavily or continuously used.

The retouched blades are defined as those which are retouched but show no gloss on the edges. One specimen (St-235) is retouched on one side and three specimens (St-236 - St-238) are on both sides. Another specimen (St-239) has retouches on one end creating a steep end like a scraper.

The notched blade has a notch on one side. No trace of use-wear can be observed on the notched edge.

In addition to tools, 13 blades with no sickle gross were identified (St-233, St-240 - St-251). All specimens are secondary flakes with no cortex which are similar in size to sickle blades. One specimen has bitumen, which may have been appilied for attachment to a handle, on the surface. It may be that these blades and bladelets represent sickle blades of that were little used or those which were kept for future use.

In terms of the spatial and stratigraphic distributions, 18 specimens of tan-grey chert blades and bladelets occur in the Central Area (Phase 5), seven specimens in the East Area (Phase 4), one specimen in the West Area, three specimens in the Northwest Area (Phase 2), and five specimens in the North Area (Phase 4). One specimen was found in the surface.

(Endo)

4.5 Poundingstones

(Figures 7.128 - 7.130, 7.135 - 7.138, Table 7.47)



Figure 7.119 Unfinished stone beads (1:1)



Figure 7.120 Unfinished stone beads (1:1)

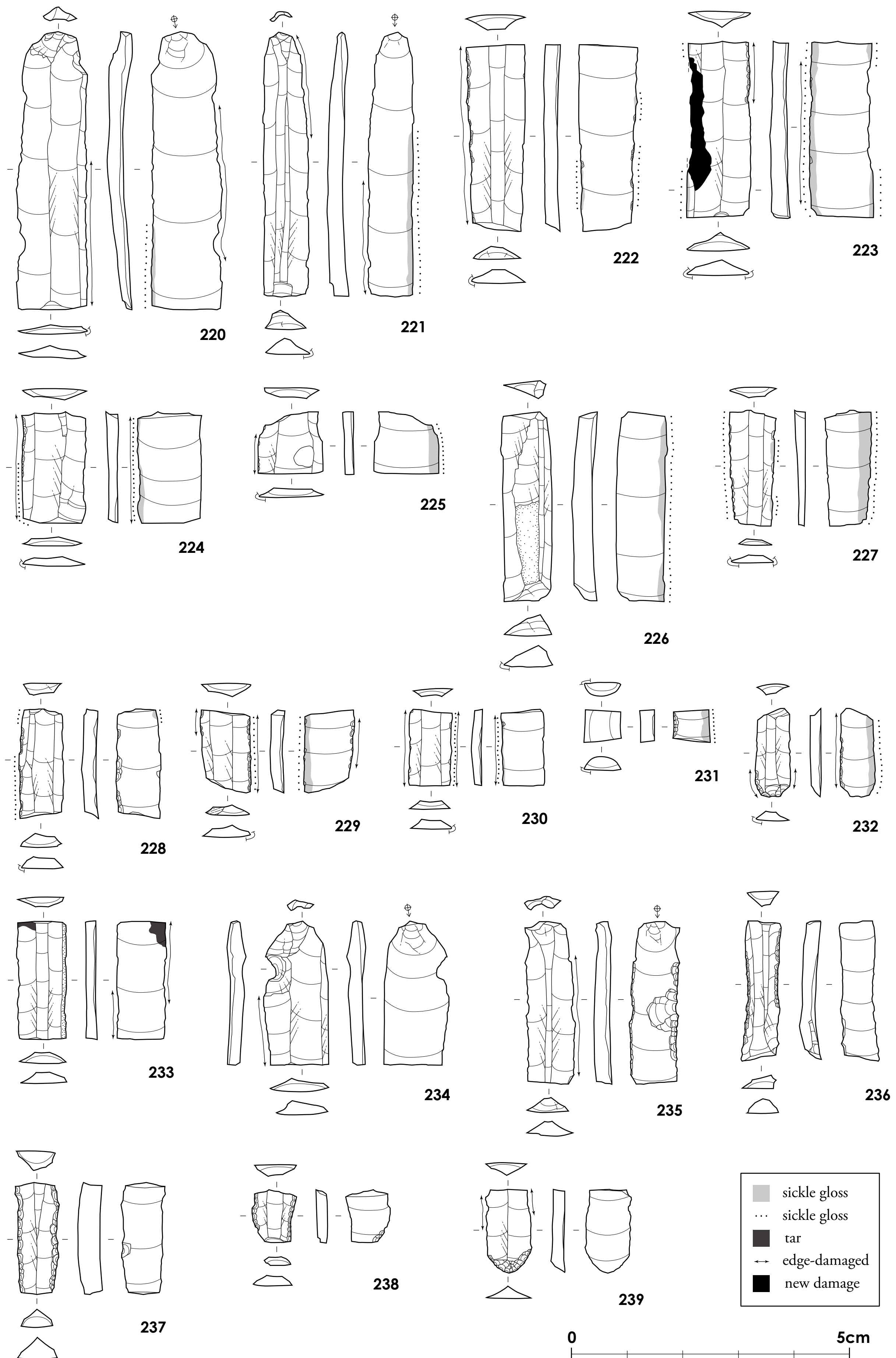


Figure 7.121 Tan-grey chert tools (1:1)

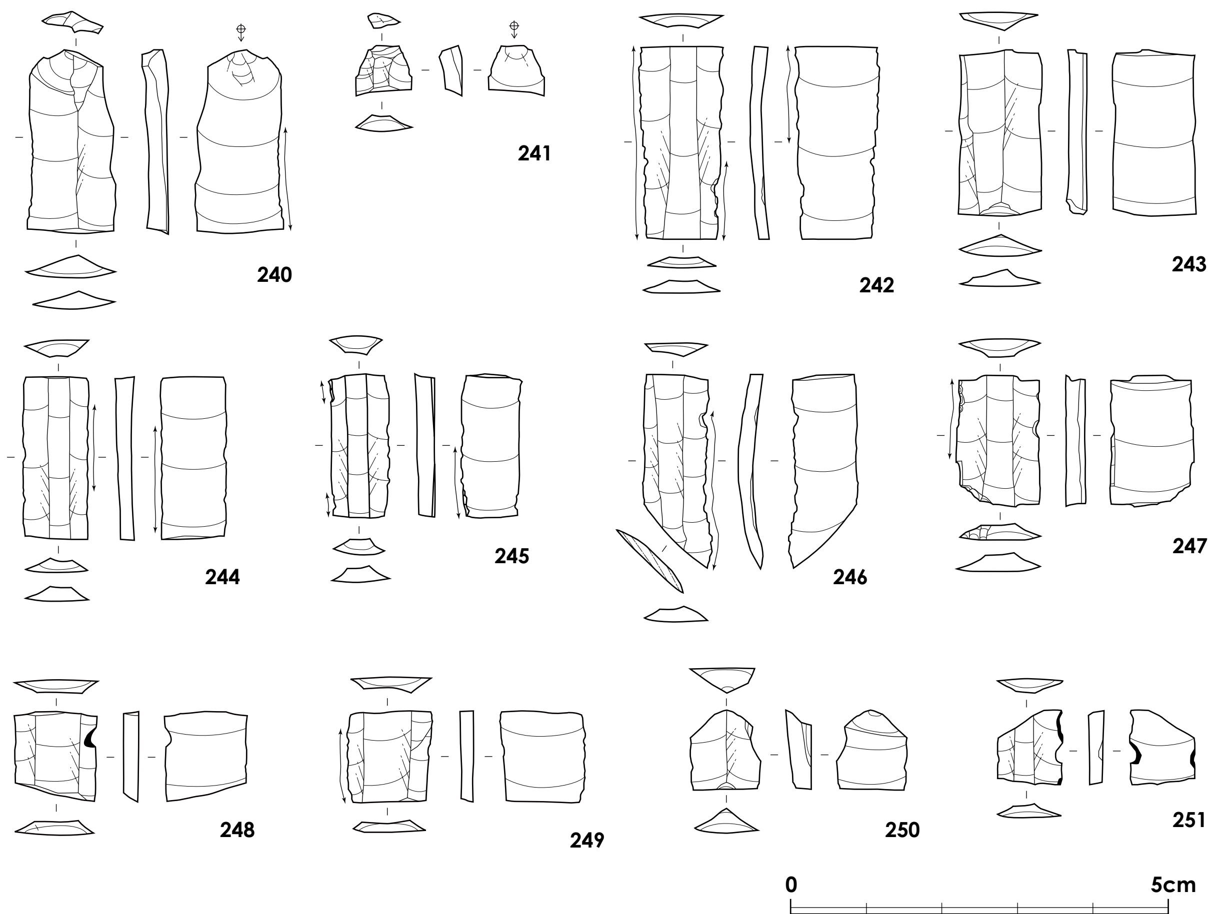


Figure 7.122 Tan-grey chert blades (1:1)

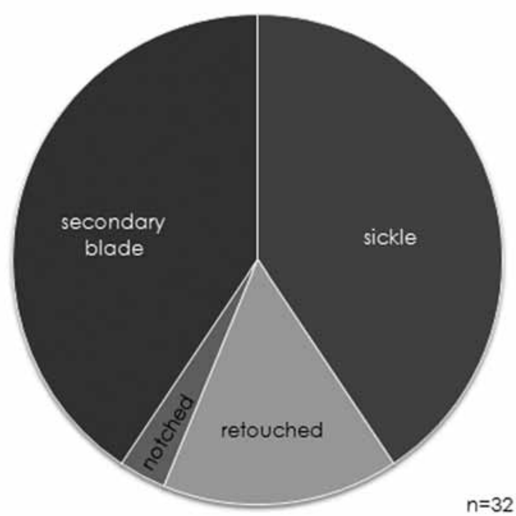


Figure 7.123 Pie chart showing percentages of tan-grey chert tools

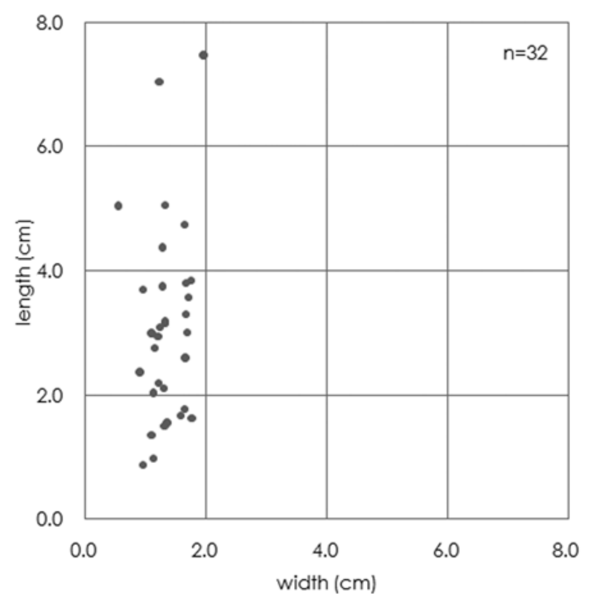


Figure 7.124 Scattergram showing the size of tan-grey chert tools

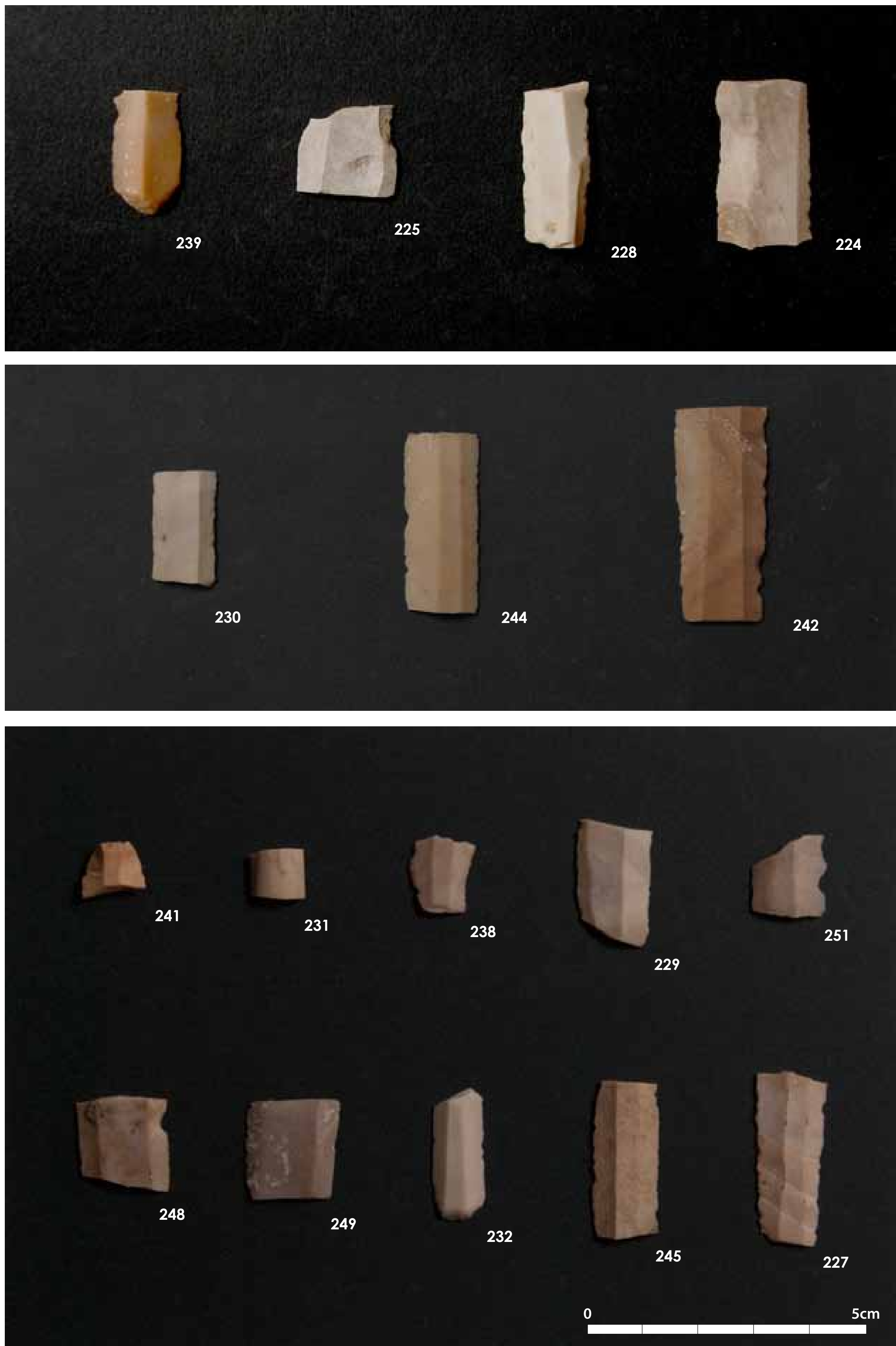


Figure 7.125 Tan-grey chert blades (1:1)



Figure 7.126 Tan-grey chert blades (1:1)



Figure 7.127 Tan-grey chert blades (1:1)

Table 7.46 Area-wise stratigraphic distribution of chert blades

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	1	0	0	0	0	0	0	0	1
Phase 5	18	18	0	0	0	0	0	0	0
Phase 4	12	0	7	0	0	0	5	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	3	0	0	0	3	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	1	0	0	1	0	0	0	0	0
Total	35	18	7	1	3	0	5	0	1

Table 7.47 Area-wise stratigraphic distribution of poundingstones

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	3	0	0	0	0	0	0	0	3
Phase 5	30	29	0	0	0	1	0	0	0
Phase 4	5	0	4	0	0	1	0	0	0
Phase 3	5	3	0	0	0	0	2	0	0
Phase 2	2	0	0	0	2	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	1	0	0	0	1	0	0	0	0
Total	46	32	4	0	3	2	2	0	3

Table 7.48 Area-wise stratigraphic distribution of querns

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	8	0	0	0	0	0	0	0	8
Phase 5	11	11	0	0	0	0	0	0	0
Phase 4	3	0	2	0	0	1	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	3	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	22	11	2	0	0	1	0	0	8

Table 7.48 Area-wise stratigraphic distribution of stone balls

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	1	0	0	0	0	0	0	0	1
Phase 5	27	27	0	0	0	0	0	0	0
Phase 4	3	1	0	0	0	1	1	0	0
Phase 3	3	1	0	0	0	2	0	0	0
Phase 2	1	0	0	0	1	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	1	0	0	0	1	0	0	0	0
Total	36	29	0	0	2	3	1	0	1

Those categorized as poundingstones are mostly distinguished by being a multi-purpose for pounding and hammering. In other words, one specimen has traces of both pounding and hammering.

46 specimens were retrieved from the excavations. They are made of sandstone.

In terms of formal features, they can be classified into the following types based on the Zingg Diagram (Zingg 1935). This Zingg Diagram is based on the measurements of length (long axis: a), width (shorter axis: b) and intermediate axis between the two (c) and the ratio between b to a (b/a) and between c to b (c/b). These two ratios are placed on a graph making 2/3 of each as axes. This method is effective in the formal classification of ellipsoid shapes.

Type 1 Discoidal (b/1>2/3, c/b<2/3)
Type 2 Spherical (b/a>2/3, c/b>2/3)
Type 3 Bladed (b/a<2/3, c/b<2/3)
Type 4 Rod-shaped (b/a<2/3, c/b>2/3)

As shown above, the spherical shape is dominant among 22 specimens. They show a range of 3.2 cm to 9.6 cm in long axis and 2.6 cm to 7.3 cm in intermediate axis. No clear size concentration can be observed.

In terms of their use, 20 specimens show traces of pounding, two specimens of hammering and 20 specimens indicates traces of both nature. These figures indicate that these tools were multi-purpose, depending on the circumstances. Among those with traces of hammering, 12 specimens show a single functional face and 10 specimens indicate multiple functional faces. In those with traces of pounding, while 15 specimens show a single functional face, 25 specimens exhibit multiple functional faces of use.

Of 46 specimens, 29 specimens come from the Central Area (Phase 5), four from the East Area (Phase 4), three from the Northwest Area (two from Phase 2 and one from a dump), two from the North Extension (one each from Phases 4 and 5, and two from the North Area (Phase 3). Three specimens were collected from the surface.

(Endo)

4.6 Querns

(Figures 7.133, 7.139 - 7.142, Table 7.48)

22 specimens of querns were unearthed in the excavations. Most of them are rectangular on plan, while a few of them are oblong or circular. They are made of sandstone.

In size, two groups can be defined based on the measurements of their intact portions, i.e. smaller ones of 7.8 cm to 15.0 cm in long axis and 3.9 cm to 10.5 cm in intermediate axis and larger ones with 16.4 cm to 26.9 cm in long axis and 13.4 cm to 22.0 cm in intermediate axis.

In terms of use, most specimens show a concave face on one side. Two specimens (St-266, St-269) have traces of hammering in the centre in addition to traces of pounding.

Among 22 specimens, 11 specimens were found in the Central Area (Phase 5), two in the East Area (Phase 4), three in the Northwest Area (Phase 2) and eight on the surface.

(Endo)

4.7 Balls

(Figures 7.134, 7.138)

36 specimens of stone balls were unearthed in the excavations. All specimens are made of sandstone. Thirty-four complete specimens show a range of 2.39 cm to 4.78 cm in diameter and weigh 16 g to 120 g. The distribution of diameter in 1 cm classes and weights in 10 g classes are shown in Figure 7.131. This table shows that there is a concentration in a range of 2.1 to 4.0 cm. In weight, a fair number of specimens weighs between 11 g and 60 g. A few specimens are significantly heavier than the others, exceeding 100 g.

Among 36 specimens, 29 specimens are derived

Figure 7.128 Size distribution of poundingstones

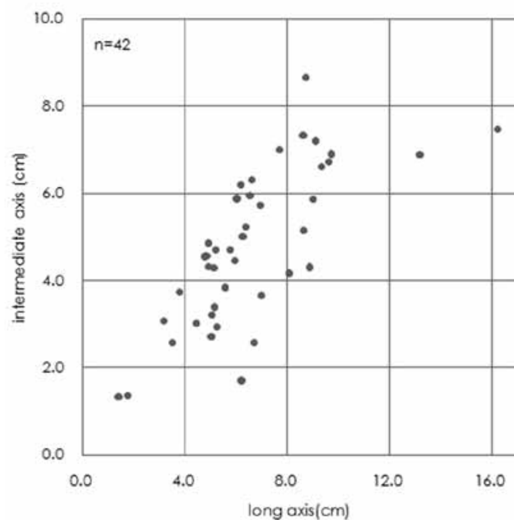


Figure 7.129 Zingg diagram of poundingstones

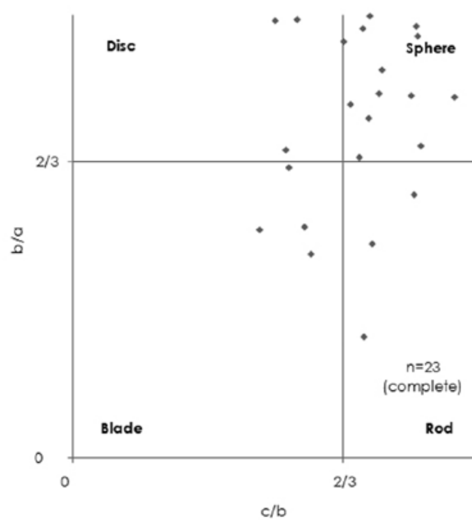


Figure 7.130 Size distribution of querns

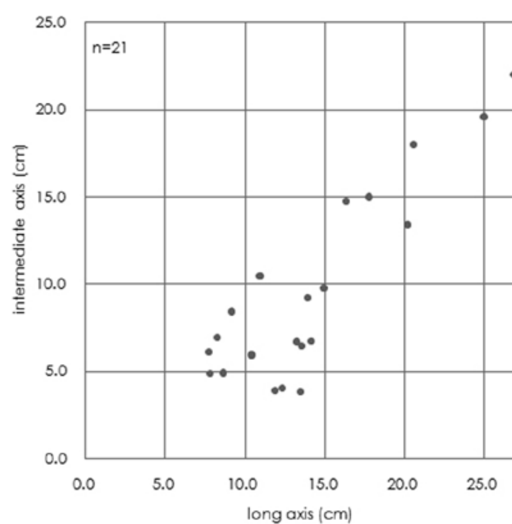
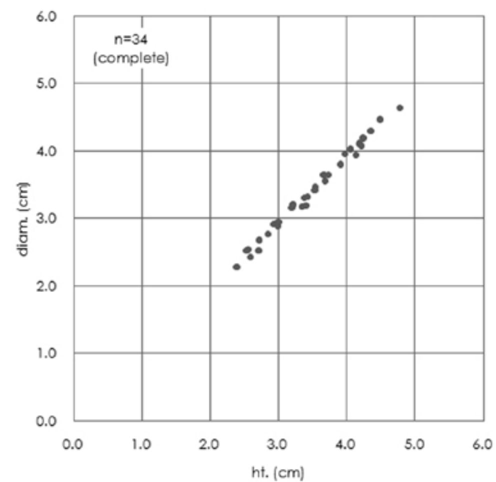


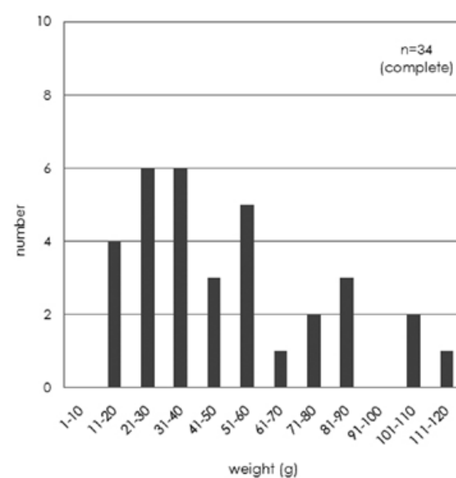
Table 7.49 Size distribution of stone balls

Class	*Range (cm)*	*no.*
1	0.1-1.0	0
2	1.1-2.0	0
3	2.1-3.0	12
4	3.1-4.0	20
5	4.1-5.0	8

Class	*weight*	*no.*
1	1-10	0
2	11-20	4
3	21-30	6
4	31-40	6
5	41-50	3
6	51-60	5
7	61-70	1
8	71-80	2
9	81-90	3
10	91-100	0
11	101-110	2
12	111-120	1

Figure 7.131 Size distribution of stone balls (above: height:diameter, below: weight)





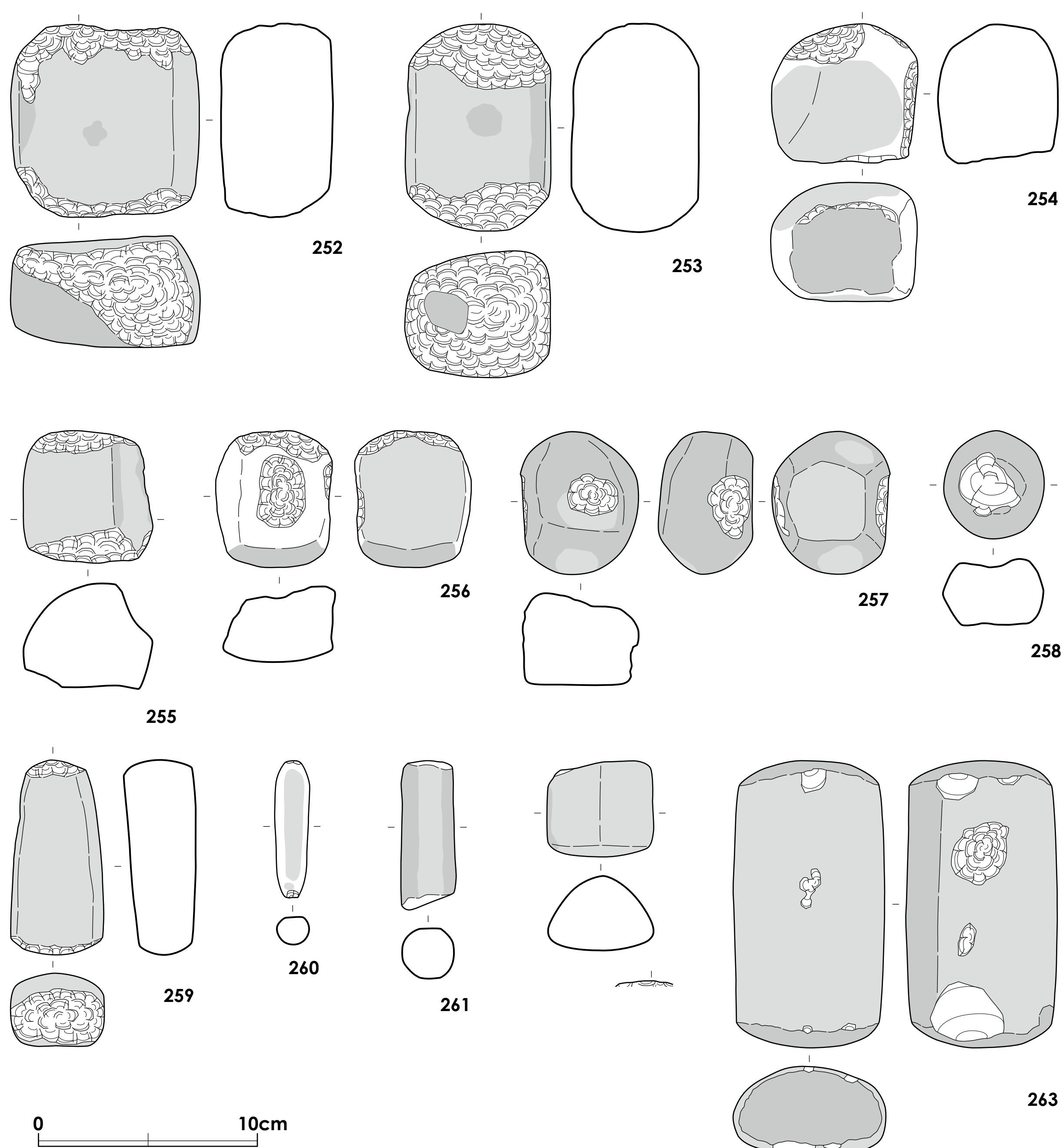


Figure 7.132 Poundingstones (1:3)

from the Central Area (27 specimens from Phase 5 and one each from Phases 3 and 4), two specimens from the Northwest Area (one each from Phase 2 and a dump), three specimens from the North Extension (two from Phase 3 and one from Phase 4), one specimen from the North Area (Phase 4) and one specimen from the surface.

(Endo)

4.8 Weights

(Figures 7.143, 7.144)

Two specimens of weights were retrieved from the excavations. St-296 is made of white-banded black chert. It measures 1.0 cm in width, 0.7 cm in thickness and 0.9 cm in height (not weighed). St-297 is made of whitish chert and measures 1.6 cm in width, 1.0 cm in thickness and 2.1 cm in height and weighing 7.09 g.

Both specimens come from Phase 5 of the Cenral Area.

(Uesugi)

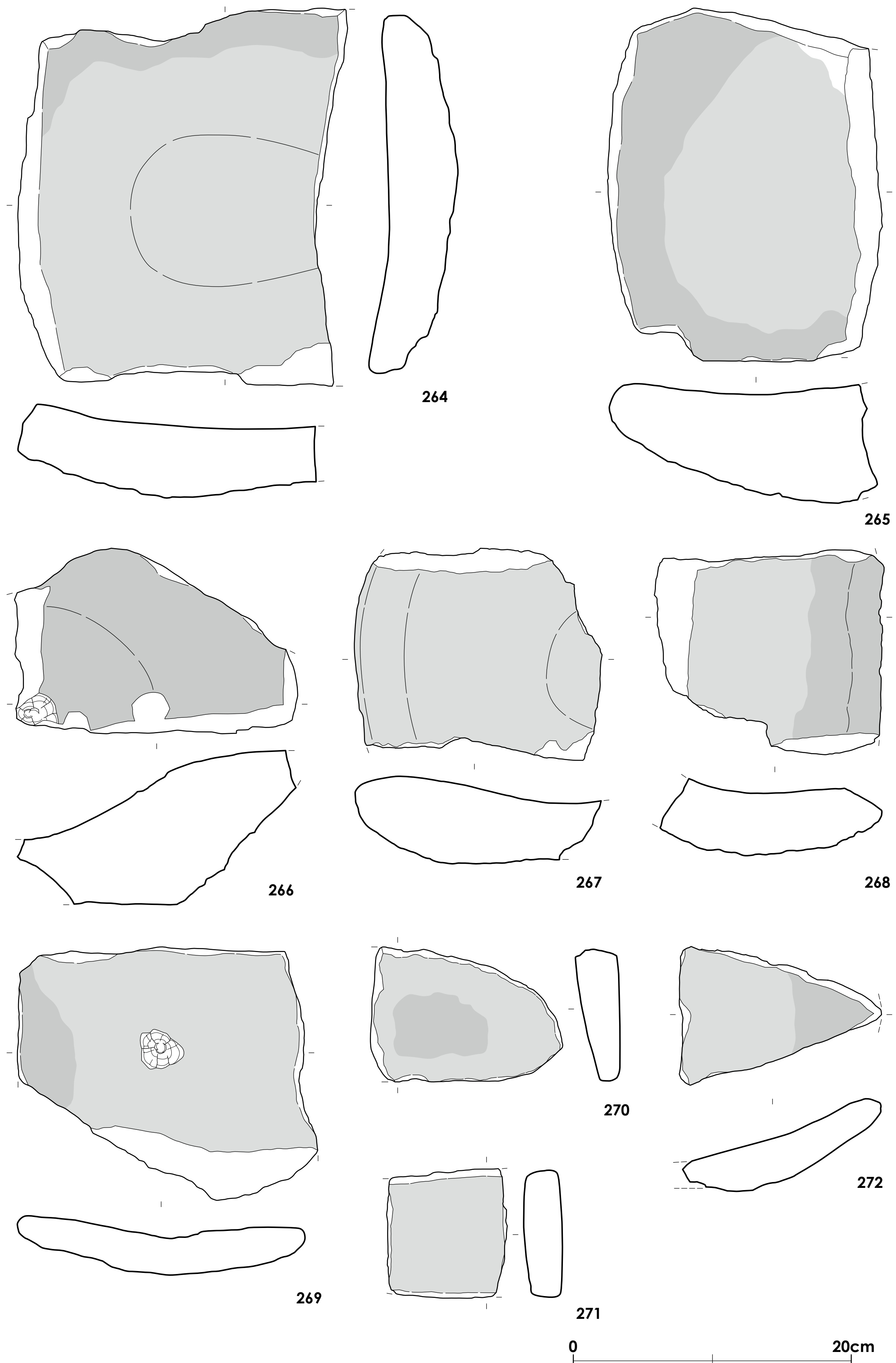


Figure 7.133 Querns (1:4)

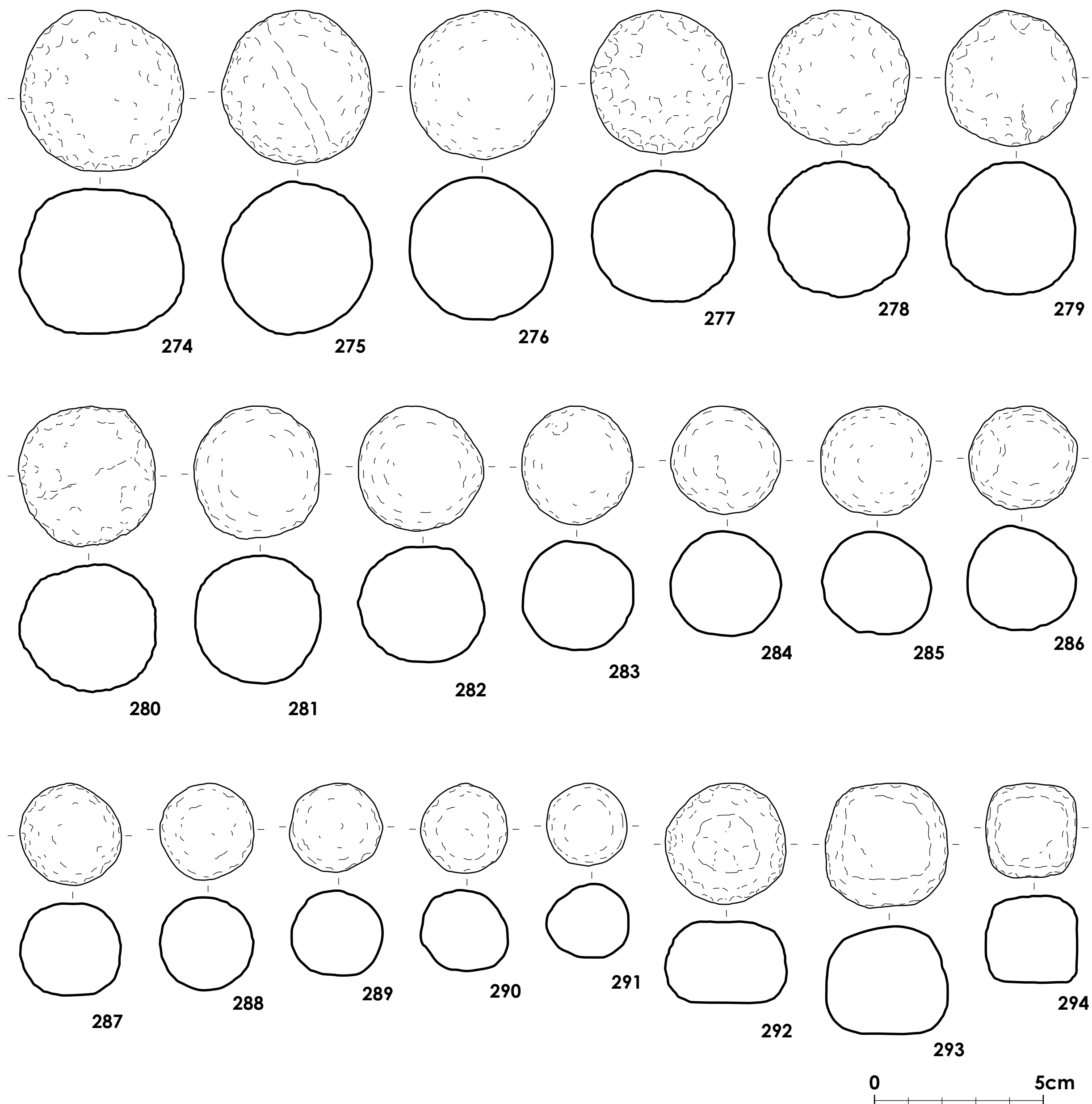


Figure 7.134 Stone balls (1:2)

4.9 Indeterminate objects
(Figures 7.143, 7.144)

20 specimens of indeterminate stone objects were collected from the excavations. Among them

St-303 found in Phase 5 of the Central Area has a pointed end and a rounded end. Its surface is well polished. It measures 8.9 cm in length, 3.2 cm in width and 1.4 cm in thickness. It is made of shale.

St-298 is missing one end and has an elongated trapezoidal shape with a plano-convex section. The surface is well polished. It measures 2.7 cm in intact length, 1.2 cm in intact width and 0.5 cm in thickness. It is made of banded chert. It comes from Phase 5 of the Central Area.

St-302, found in Phase 4 of the North Area, is a rectangular parallelpipe in shape. One end is missing. It measures 4.8 cm in intact length, 2.0 cm in width and 1.0 cm in thickness. It is made of chert.

St-300 found in Phase 3 of the North Area has also rectangular section, and has an end of an irregular shape. Although some traces of knapping are observed in some parts, the surface is well polished. It measures 4.0 cm in intact length, 2.5 cm in width and 1.2 cm in thickness. It is made of chert.

245, collected from Phase 5 of the Central Area,



Figure 7.135 Poundingstone (1:1)



Figure 7.136 Poundingstone (1:1)



Figure 7.137 Poundingstone (1:1)



Figure 7.138 Stone balls and poundingstone (1:1)



Figure 7.139 Quern (1:2)



Figure 7.140 Quern (1:2)



Figure 7.141 Quern (1:2)



Figure 7.142 Quern (1:2)

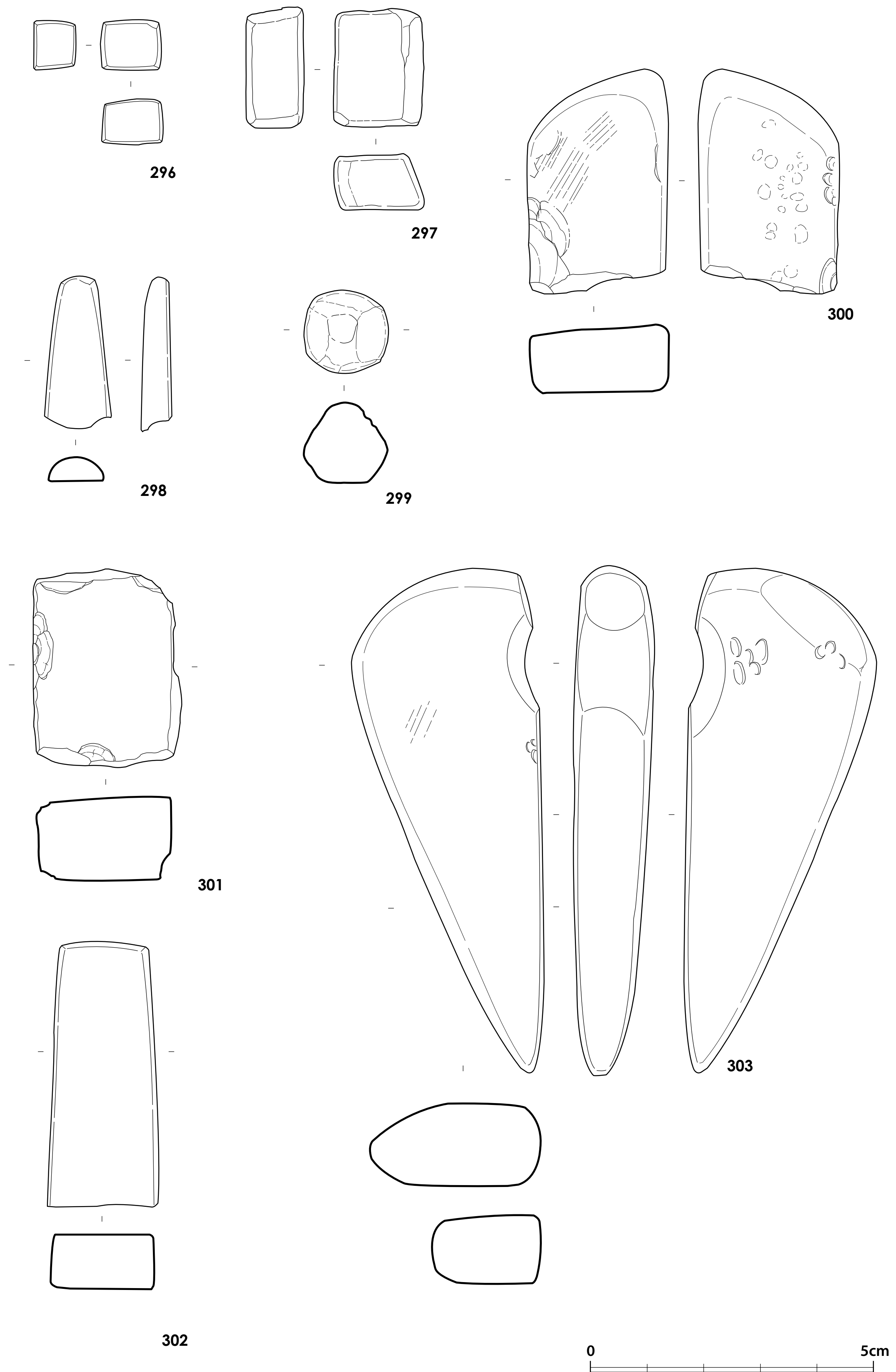


Figure 7.143 Stone objects (1:1)



Figure 7.144 Stone objects (1:1)

is also a rectangular parallelpiped in shape. Traces of knapping are observable in some parts. It measures 3.6 cm in length, 2.6 cm in width and 1.5 cm in thickness. It is made of sandstone.

(Uesugi)

5 FAIENCE OBJECTS

5.1 Outline

58 specimens of faience beads were unearthed in the excavations. They can be classified into the following forms.

Bangles	11
Beads	46
Indeterminate object	1

(Uesugi)

5.2 Bangles

(Figures 7.145, 7.148, Table 7.51)

11 specimens of faience bangles were retrieved from the excavations. All of them are fragmentary in nature. The section shape can be divided into the following types.

Type 1	Narrow circular (n=5)
Type 2	Wide plano-convex (n=5)
Type 3	Wide lenticular (n=1)

Of the total 11 specimens, eight specimens are decorated with incised grooves on their external side. They occur in Type 1 (two specimens), Type 2 (five specimens) and Type 3 (one specimen).

In Type 1, the incised grooves are simply arranged in a parallel oblique pattern (F-1, F-2). In one specimen, a change in direction of parallel oblique grooves can be observed. In 08-811, parallel oblique grooves in one direction are intact.

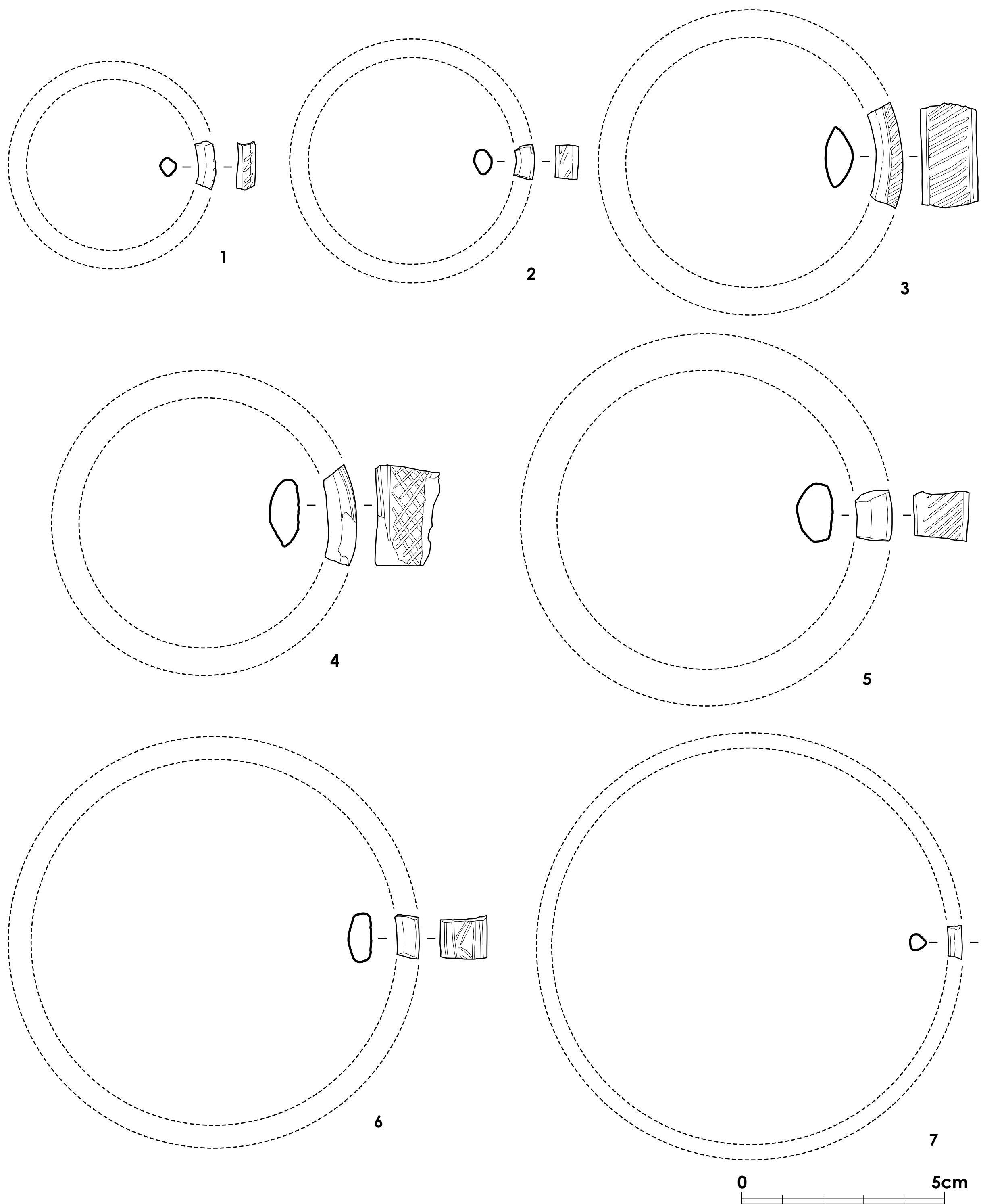


Figure 7.145 Faience bangles (2:3)

All specimens of Type 2 are decorated by incised grooves, which represent a parallel oblique pattern in two specimens (F-5, F-6) and oblique chequerboard pattern in two others (F-4). In one specimen of Type 2, a section of parallel curvilinear grooves is intact, although the entire pattern is uncertain.

In one specimen of Type 3 (F-3), parallel oblique grooves are executed. In the specimens of Types 2 and 3, the incised grooves are flanked by two parallel straight grooves around the edge.

All of them are greenish in colour.

Six specimens come from the Central Area (Phase 5), four from the Northwest Area (two from Phase 2 and two from a dump), and one from the North

Extension (Phase 4).

(Uesugi)

5.2 Beads

(Figures 7.146, 7.147, 7.149, Tables 7.50, 7.52)

46 specimens of faience beads were found in the excavations. They can be classified into the following types based on the section and profile shapes.

[Type 1]

Type 1 or cylindrical shape (F-8 - F-12) is the most common (29 specimens), varying in size from 1.9 mm to 20.1 mm. Among them, a greenish colour is dominant (12 specimens), but there is also one banded green and white specimen, two black specimens, three greyish examples, 10 beads of a lapis lazuli-like dark blue colour and two red specimens.

[Type 2]

Type 2, which is barrel shaped in profile and circular in plan (F-13 - F-18) is found in nine specimens, varying in length from 7.4 mm to 17.9 mm. In colour, three specimens are greenish, one is black, one is red-black, one is black and white in bands, two are dark blue like lapis lazuli and one is red. The specimen of banded black and white is probably an imitation of banded jasper.

[Type 3]

Type 3, which is barrel shaped in profile and lenticular in section (F-19) is represented by four specimens that show a variation in length. Two specimens are greenish and two red.

[Type 4]

There are two specimens of Type 4, which is globular in profile with a circular section (F-20) counts two specimens. The size is quite uniform and small. Their colour is lapis-like dark blue.

[Type 5]

Type 5 (F-21, F-22) is distinguished by grooves dividing the cylindrical shapes into compartments. It has a greenish glaze.

[Type 6]

Type 6 or a biconical shape (F-23) is represented by one specimen. It is greenish in colour.

[Type 7]

Type 8 has a lenticular plan and a rectangular side (F-38). It has black and white in bands.

[Type 8]

Two fragments of uncertain shape are included in this type.

In terms of spatial and stratigraphic distributions, the faience beads occur in the Central Area (31 specimens), the East Area (10 specimens), the west area (one specimen), the Northwest Area (two specimens) and the North Area (five specimens). In the Central Area, one specimen comes from Phase 4 and 30 specimens from Phase 5. Those from the East Area belong to Phase 4. Three specimens of those from the North Area belong to Phase 3 and two specimens to Phase 4. Finally those from the Northwest Area were found in a dump.

(Uesugi)

5.4 Indeterminate object

(Figure 7.148)

One fragment with a glaze on one side was found in the excavations (F-40). It measures 6 mm in thickness and may be a part of a vessel. It comes from Phase 5 of the Central Area.

(Uesugi)

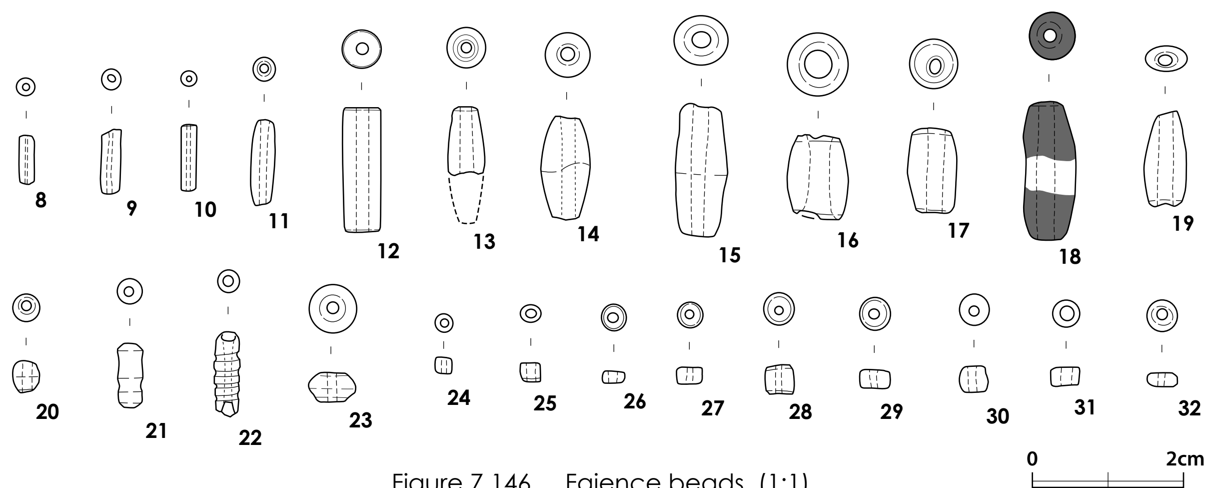


Figure 7.146 Faience beads (1:1)

Table 7.50 Classification of faience beads

	Side	*Plan*	*no.*	*L (mm)*	*D/W, T (cm)*	*Colour*
Type 1	Cylindrical	Circular	29	1.9-20.1	2.0-4.6	green, green and white, black, grey, lapis, red
Type 2	Barrel	Circular	9	7.4-17.9	4.1-8.0	green, black, black-red, black and white, lapis, red
Type 3	Barrel	Lenticular	4	9.4-15.7	5.5-9.6 / 3.4-6.7	green, red
Type 4	Globular	Circular	2	3.2-3.7	3.4-4.0	lapis
Type 5	Compartmented	Circular	2	8.3-10.9	2.5-2.9	green
Type 6	Biconical	Circular	1	3.7	5.7	green
Type 7	Rectangular	Lenticular	1	7	6.5 / 4.0	black and white
Type 8	Indeterminate		2			

L: Length, D: Diameter, W: Width, T: Thickness

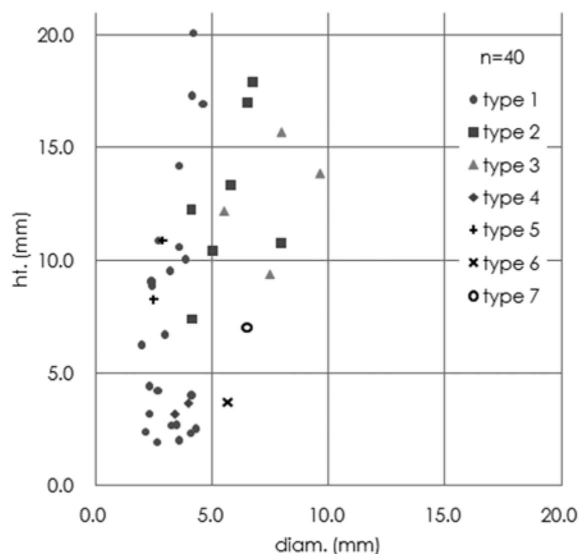


Figure 7.147 Size distribution of faience beads

6 SHELL OBJECTS

6.1 Outline

The excavations yielded 102 shell objects. They can be classified into the following forms.

Bangle	77
Beads	13
Discs	2
Cowrie shells	4
Others	6

(Uesugi)



Figure 7.148 Faience bangles and indeterminate object (2:1)

Figure 7.149 Faience and stone beads (2:1) (For S-100, see the section of the stone beads)

Table 7.51 Area-wise stratigraphic distribution of faience bangles

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	6	6	0	0	0	0	0	0	0
Phase 4	1	0	0	0	0	1	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	2	0	0	0	2	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	2	0	0	0	2	0	0	0	0
Total	11	6	0	0	4	1	0	0	0

Table 7.52 Area-wise stratigraphic distribution of faience beads

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	28	28	0	0	0	0	0	0	0
Phase 4	13	1	10	0	0	0	2	0	0
Phase 3	3	0	0	0	0	0	3	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	2	0	0	0	2	0	0	0	0
Total	46	29	10	0	2	0	5	0	0

6.2 Bangles

(Figure 7.150, 7.152, 7.153, Table 7.53)

77 specimens of shell bangles were found in the excavations. All of them are fragmentary in nature. Their size cannot be estimated as the shells used for bangles are not entirely circular in section.

One specimen (Sh-33) is decorated by parallel oblique grooves on both vertical sides. Three specimens (Sh-1, Sh-2, Sh-32) show holes on one end. Sh-34 has a flat section with ledged borders.

57 specimens come from the Central Area, six from the East Area, five from the Northwest Area, four from the North Extension and five from the North Area. Among those from the Central Area, two specimens belong to Phase 2, one to Phase 4 and 54 to Phase 5. Those found in the East Area were from Phase 4. One from the North Extension belong to Phase 1 and three to Phase 3. The bangles from the North Area come from Phase 4. Those from the Northwest Area were found in a dump.

(Uesugi/Konasukawa)

6.3 Beads

(Figures 7.151, 7.154, 7.155, Table 7.54)

13 specimens of shell beads were found in the excavations. Among them, ten specimens are subjected to formal classifications. They can be classified into the following types.

Type 1 Short cylindrical
Type 2 Biconical

[Type 1]

Nine specimens of short cylindrical beads (Sh-40 - Sh-48) are identified. They measure 2.2 mm to 11.7 mm in diameter and 0.9 mm to 10.3 mm in height. Sh-43 - Sh-45 are irrengular in shape due to the nature of the material of shell. 43 has hollows on both ends.

[Type 2]

Only one specimen (Sh-49) represents a biconical shape. It measures 11.7 mm in diameter and 6.5 mm in height.

Nine specimens come from the Central Area (one in phase 2 and eight in Phase 5), one comes from the Northwest Area (a dump), one from the North Area (Phase 4), and one from the surface.

(Uesugi/Konasukawa)

6.4 Discs

(Figures 7.151, 7.155)

The excavations yielded two specimens of discs. One specimen (Sh-50) is plain on both sides, measuring 1.0 cm in diameter and 0.4 cm in thickness. Another specimen (Sh-51) is engraved with radiating grooves and measures 1.6 cm in diameter and 0.25 cm in thickness. St-50 was found in Phase 3 of the Central Area and St-51 in Phase 5 of the Central Area.

(Uesugi/Konasukawa)

6.5 Cowrie shells

Four pieces of cowrie shells were retrieved from the excavations. There is no trace of processing. Phase 5 of the Central Area and Phase 4 of the North Area yielded one specimen respectively, and another two specimens were found on the surface.

(Uesugi)

6.6 Others

(Figures 7.144, 7.151)

Six additional specimens of indeterminate nature were found in the excavations. Of them three objects are described here.

Sh-52 is made from a columella ground into a conical shape. It measures 1.7 cm in diameter and 1.9 cm in intact height. It comes from Phase 4 of the Central Area.

The other two specimens are fragments of shells. One of them is of a conch and the second belongs to bivalve. No trace of processing can be observed. Both of them come from Phase 5 of the Central Area.

(Uesugi)

7 BONE AND HORN OBJECTS

7.1 Outline

142 specimens of bone and horn objects were retrieved from the excavations. They include the following forms.

Beads	6
Points	118
Spatula	12
Disc	1
Bead spacer	1
Others	4

(Uesugi)

7.3 Points

(Figures 7.156, 7.157, 7.160 - 7.163, Tables 7.55, 7.57)

118 specimens of bone points were unearthed in the excavations. Among them only 21 specimens are complete. The rest are fragmentary in nature. The complete specimens measure from 3.5 cm to 13.45 cm, showing a wide variation in length. Table 7.57 shows a distribution of length in 1cm classes. There is a concentration between 7.1 cm and 11.0 cm. The width varies from 0.43 cm to 1.36 cm. All the specimens are well ground and show no trace of use wear.

Only one specimen (B-37) is made of a horn, possibly of a cow. The pointed end is made by scraping.

In terms of the spatial and stratigraphic distribution, the Central Area yielded 79 specimens, the East Area, 11, the Northwest Area, 11, the North Extension, two, and the North Area, eight. In the Central Area, Phases 1 and 2 yielded one specimen

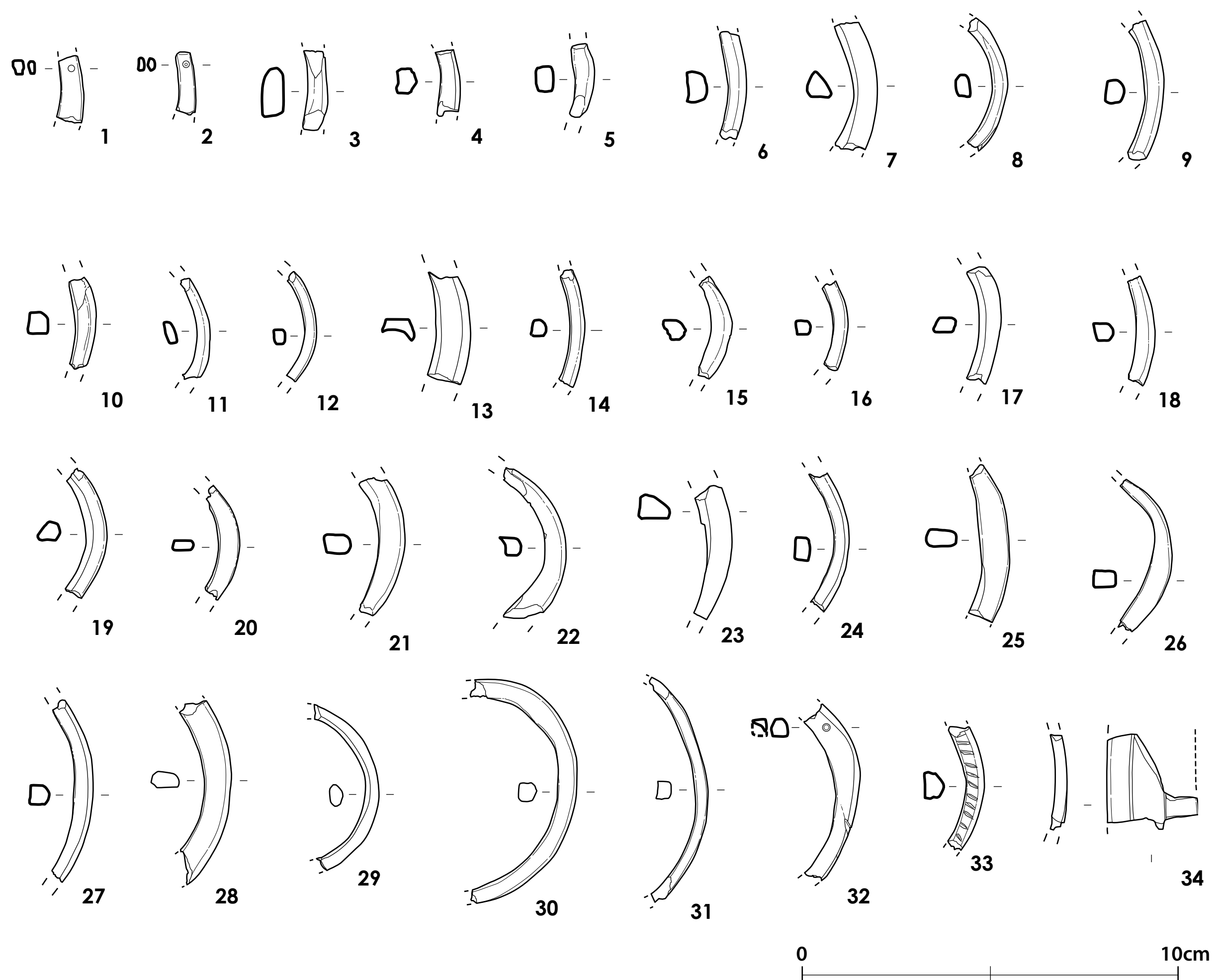


Figure 7.150 Shell bangles (1:2)

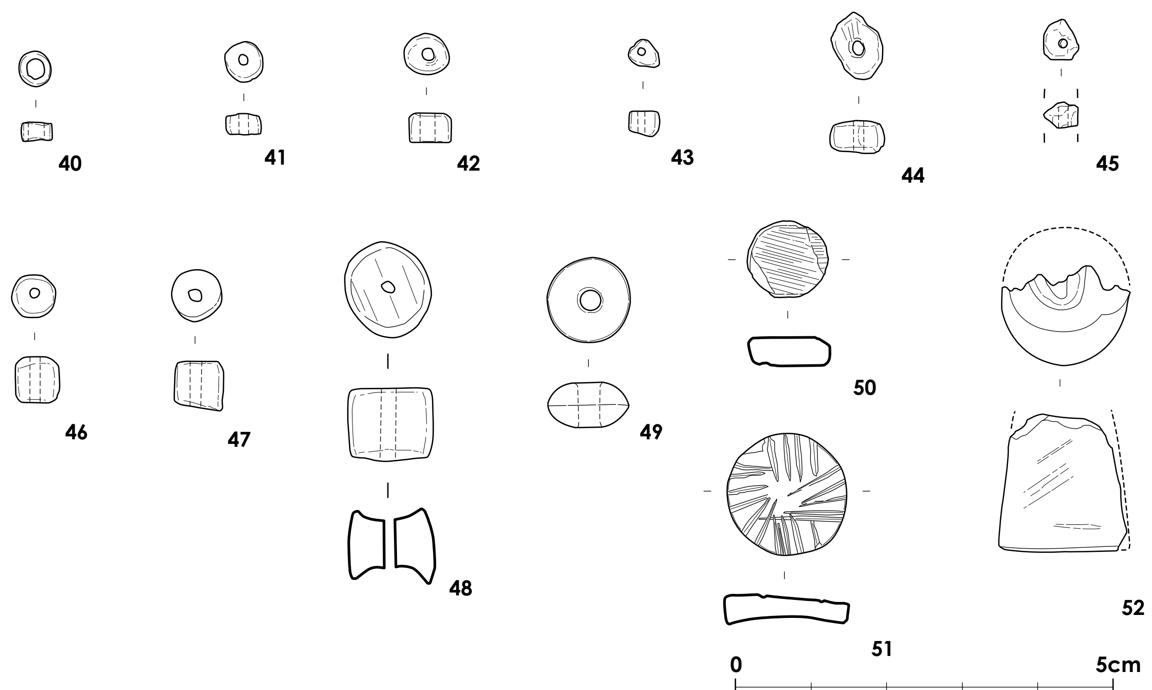


Figure 7.151 Shell beads, discs and other objects (1:1)



Figure 7.152 Shell bangles (1:1)

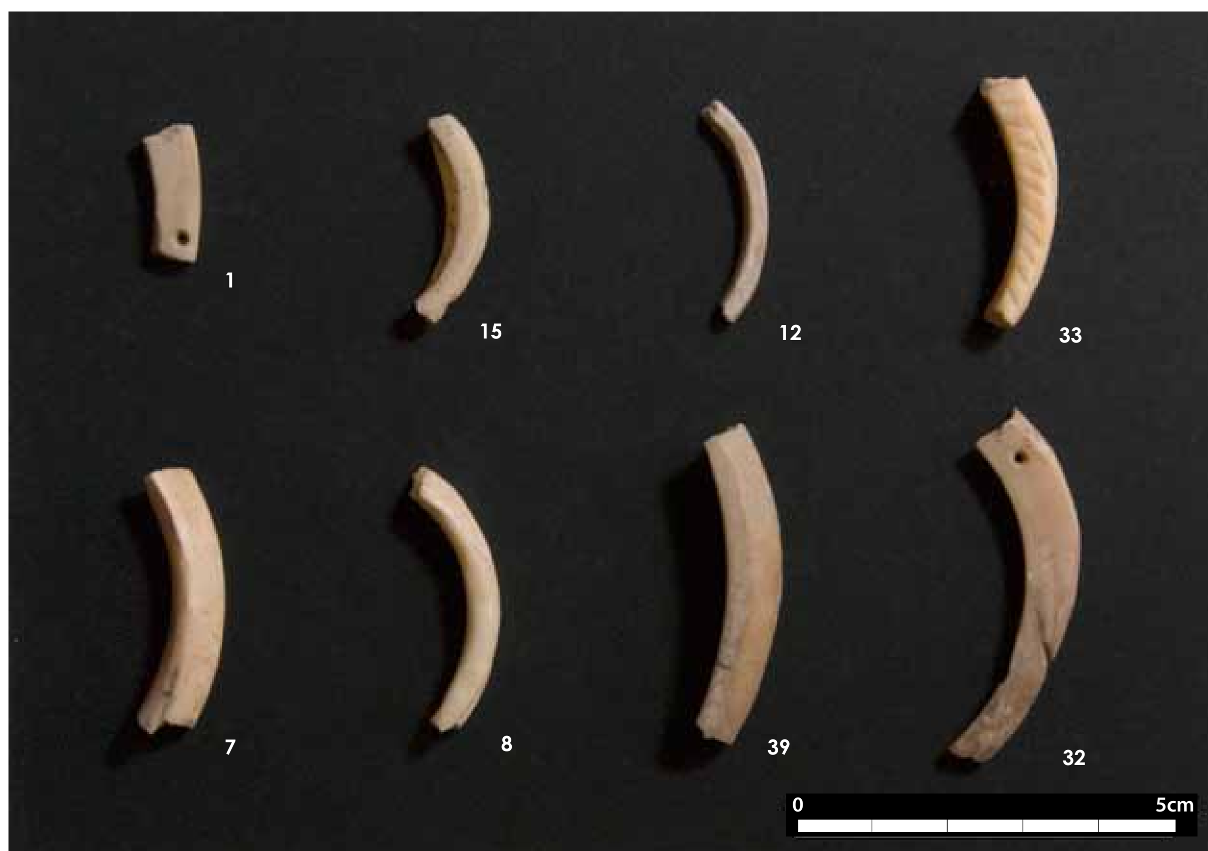


Figure 7.153 Shell bangles (1:1)



Figure 7.154 Shell beads (2:1)



Figure 7.155 Shell discs (2:1)

respectively. Phase 4 yielded four specimens and Phase 5, 73 specimens. Those from the East Area belong to Phase 4. Of those from the Northwest Area, two specimens come from Phase 2 and eight from a dump. Those from the North Extension belong to Phase 1, and from the North Area two specimens respectively were found in Phases 3 and 4.

(Konasukawa/Uesugi)

7.3 Spatula or knife

(Figures 7.158 - 7.160, 7.164, 7.165)

The bone objects with a thin section of a thickness of 0.12 cm to 0.29 cm are categorized here as spatulas or knives. Although their complete shapes are uncertain as there are no complete examples, 12 specimens have a pointed end and three have perforations.

Eight specimens were found in the Central Area (two from Phase 2 and six from Phase 5), one specimen in the East area (Phase 4), one in the Northwest Area (Phase 2), two in the North Area (Phase 3).

(Uesugi)

Table 7.53 Area-wise stratigraphic distribution of shell bangles

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	54	54	0	0	0	0	0	0	0
Phase 4	12	1	6	0	0	0	5	0	0
Phase 3	3	0	0	0	0	3	0	0	0
Phase 2	2	2	0	0	0	0	0	0	0
Phase 1	1	0	0	0	0	1	0	0	0
Uncertain	5	0	0	0	5	0	0	0	0
Total	77	57	6	0	5	4	5	0	0

Table 7.54 Area-wise stratigraphic distribution of shell beads

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	1	0	0	0	0	0	0	0	1
Phase 5	8	8	0	0	0	0	0	0	0
Phase 4	2	0	1	0	0	0	1	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	1	1	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	1	0	0	0	1	0	0	0	0
Total	13	9	1	0	1	0	1	0	1

Table 7.55 Area-wise stratigraphic distribution of bone points

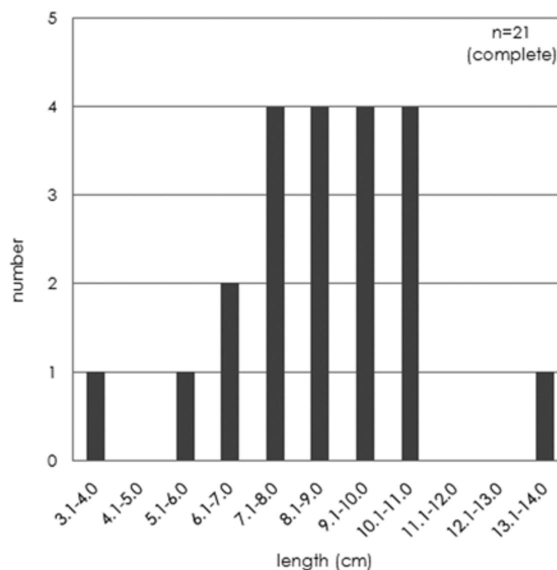
	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	80	80	0	0	0	0	0	0	0
Phase 4	19	4	11	0	0	0	4	0	0
Phase 3	4	0	0	0	0	0	4	0	0
Phase 2	4	1	0	0	3	0	0	0	0
Phase 1	3	1	0	0	0	2	0	0	0
Uncertain	0	0	0	0	8	0	0	0	0
Total	118	86	11	0	11	2	8	0	0

Table 7.56 Area-wise stratigraphic distribution of bone beads

	Total	Central Area	East Area	West Area	Northwest Area	North Extension	North Area	Kiln Area	Surface
Surface	0	0	0	0	0	0	0	0	0
Phase 5	0	5	0	0	0	0	0	0	0
Phase 4	0	0	1	0	0	0	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	6	5	1	0	0	0	0	0	0

Table 7.57 Size distribution of bone points

Class	Range	no.
1	3.1-4.0 cm	1
2	4.1-5.0 cm	0
3	5.1-6.0 cm	1
4	6.1-7.0 cm	2
5	7.1-8.0 cm	4
6	8.1-9.0 cm	4
7	9.1-10.0 cm	4
8	10.1-11.0 cm	4
9	11.1-12.0 cm	0
10	12.1-13.0 cm	0
11	13.1-14.0 cm	1



7.2 Beads
(Figure 7.167, Table 7.56)

Six specimens of bone beads were found in the excavations. Four are cylindrical and one is disc-shaped.

Of the cylindrical beads, three measure from 2.0 mm to 2.6 mm in diameter and from 0.5 mm to 17.4 mm in length, and one measures 10.0 mm in diameter and 9.1 mm in height.

The one disc-shaped bead (B-57) measures 19.9 mm in diameter and 3.3 mm in height. On one side it is engraved with lotus petals. This specimen may date to the Historical period.

Three of the cylindrical beads come from Phase 5 of the Central Area, and one from Phase 4 of the East Area. The disc-shaped beads belongs to the Phase 5 of the Central Area.

(Uesugi)

7.4 Disc
(Figures 7.159, 7.166)

One specimen of a bone disc (B-58) was unearthed in the excavations. It measures 1.7 cm in diameter and 0.2 cm in thickness. There is no decoration on either side. It was found in Phase 4 of the East Area.

(Uesugi)

7.5 Bead spacer
(Figure 7.159)

One bead spacer made of bone was identified (B-58). It has seven holes and measures 3.45 cm in length and 0.6 cm in width and 0.35 cm in thickness. It come from the Central Area (Phase 5).

(Uesugi)

7.6 Others
(Figures 7.159, 7.167)

Four specimens of indeterminate nature were retrieved from the excavations.

B-60 is a bar with a rectangular section, that tapers slightly towards one end. Both ends are missing. A concentric circle is engraved on either sides. It measures 5.3 cm in intact length, 1.7 cm in width and 0.5 cm in thickness. It comes from Phase 5 of the Central Area.

B-59 has a square plan and a trapezoidal section.

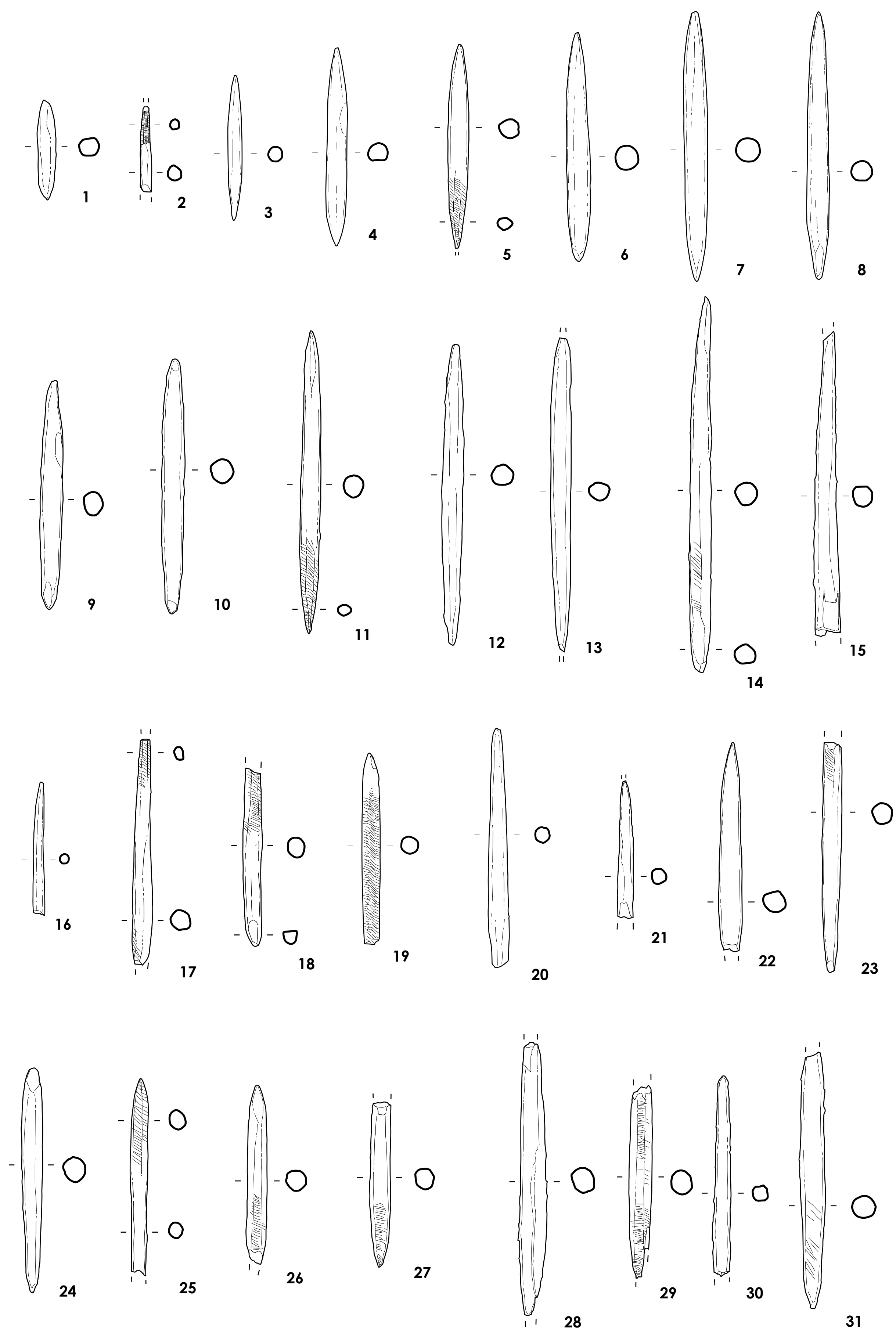


Figure 7.156 Bone points (1:2)

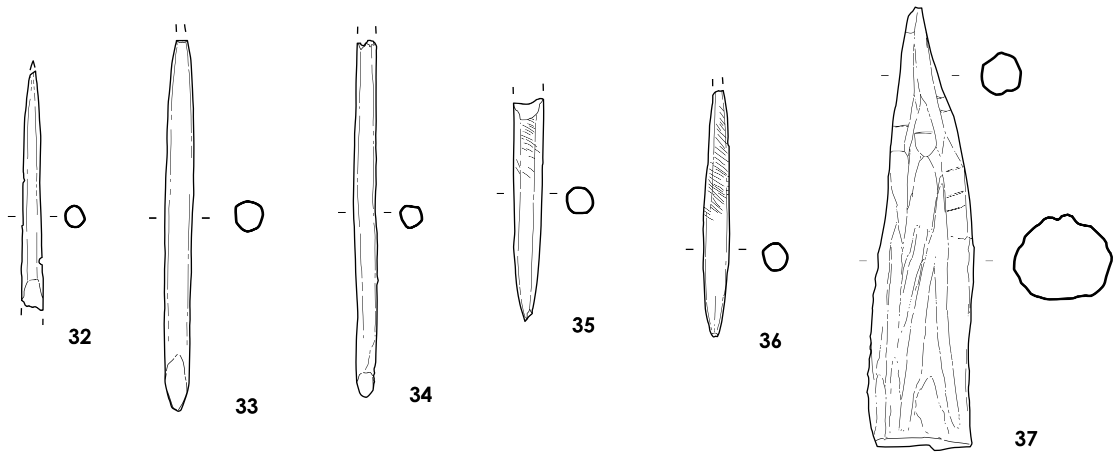


Figure 7.157 Bone and horn points (1:2)

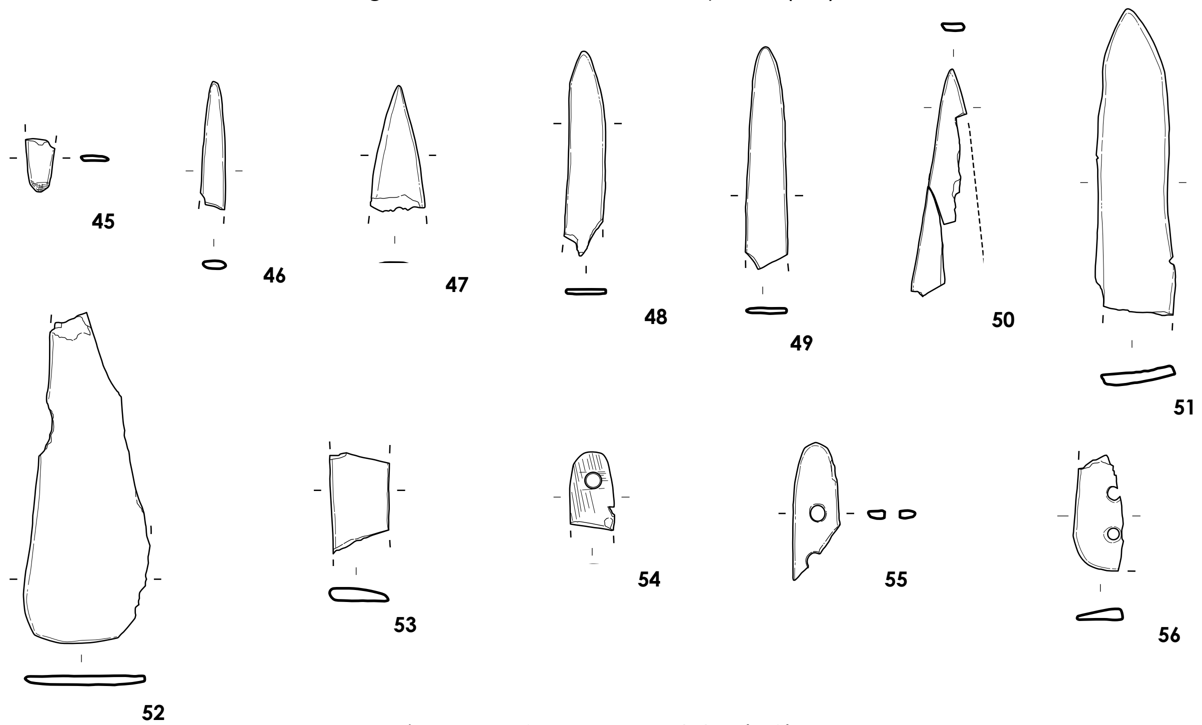


Figure 7.158 Bone spatulas (1:2)

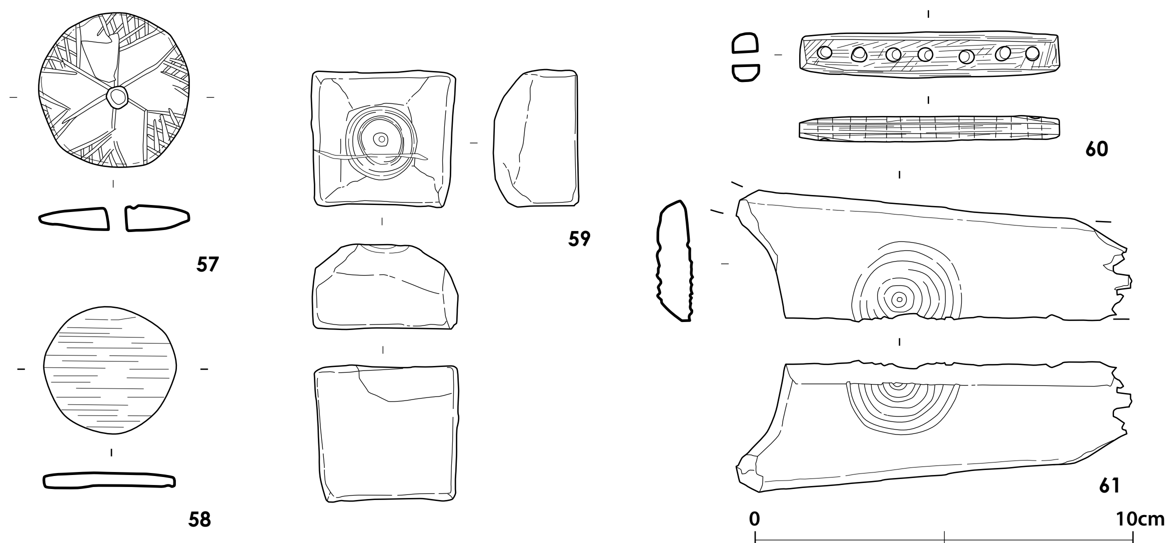


Figure 7.159 Bone objects (1:1)



Figure 7.160 Bone objects (1:1)



Figure 7.161 Bone points (1:1)



Figure 7.162 Bone points (1:1)



Figure 7.163 Bone points (1:1)



Figure 7.164 Bone spatulas (1:1)



Figure 7.165 Bone spatulas (1:1)



Figure 7.166 Bone objects (1:1)



Figure 7.167 Shell and bone objects (2:1)

A concentric circle is engraved on the top. It measures 1.9 cm in length, 1.8 cm in width and 1.1 cm in height.

(Uesugi)

8 GOLD OBJECTS

8.1 Outline

Seven specimens of gold objects were found in the excavations. They are represented by the following forms.

Beads	4
Disc	1
Cap	1
Indeterminate object	1

(Uesugi)

8.2 Beads

(Figures 7.168, 7.169)

Four specimens of gold beads were unearthed in the excavations. Of them, three are short cylindrical in shape measuring 3.0 mm to 4.7 mm in diameter and 1.5 mm to 3.5 mm in height. One specimen is disc shaped with a diameter of 12.5 mm and a thickness of 0.5 mm. The latter has a main perforation of 2.5 mm in diameter and two subsidiary 1 mm in diameter holes flanking the main perforation. A design consisting of a crisscross and four curvilinear lines is embossed on the surface.

All specimens of cylindrical beads come from Phase 5 of the Central Area and the one specimen of disc-shaped bead from a dump of the Northwest Area.

(Uesugi)

8.3 Disc

(Figures 7.168, 7.169)

One specimen of gold disc (M-5), measuring 1.25 cm in diameter and less than 0.05 cm in thickness, was found in the excavations. It comes from Phase 4 of the North Extension.

(Uesugi)

8.4 Cap

(Figure 7.168, 7.169)

One specimen of gold cap (M-4) was unearthed in the excavations. It is conical in shape with a hollow inside. It may have capped on some other object. It measures 0.9 cm in diameter, 0.3 cm in height and less than 0.05 cm in thickness. It comes from Phase 5 of the Central Area.

(Uesugi)

9 COPPER OBJECTS

9.1 Outline

89 specimens of copper objects were found in the excavations. They can be classified into the following forms. It should be noted that the results of composition analysis of copper are reported in Chapter 10.

Arrowheads	7
Spearhead	1
Axes	2
Chisels	3
Points	2
Hooks	6
Bangles	13
Beads	3
Rings	13
Rods	24

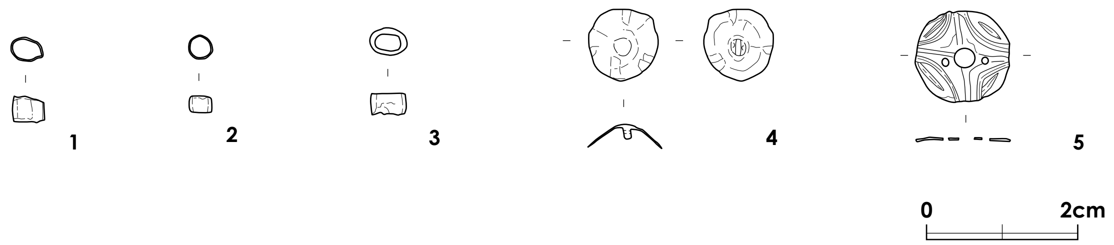
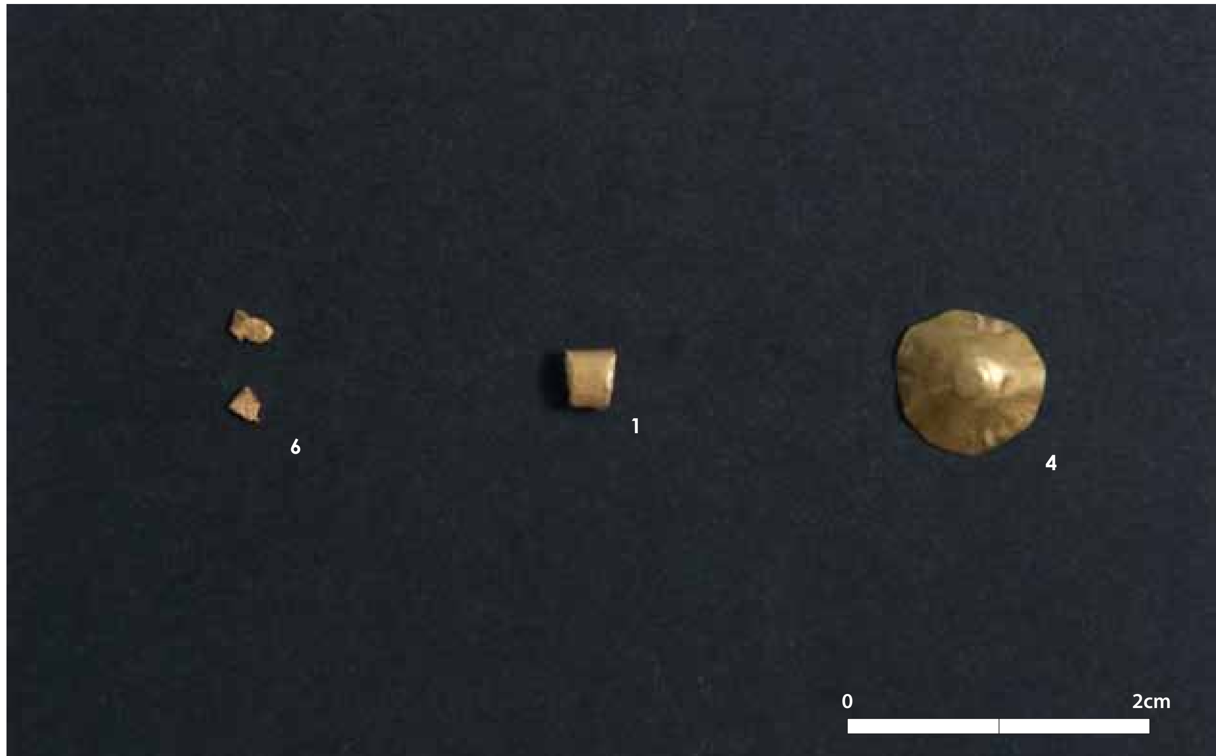


Figure 7.168 Gold objects (1:1)



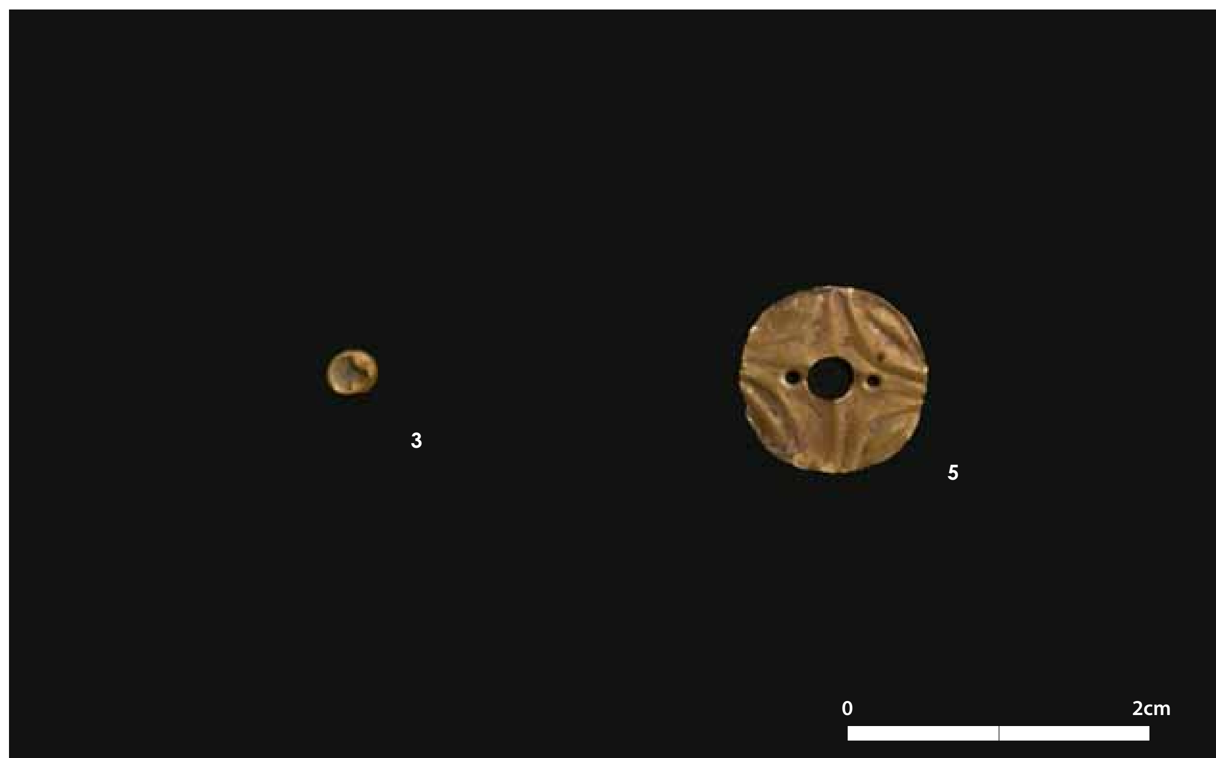


Figure 7.169 Gold objects (2:1)

Horseshoe-shaped object	1
Wire	1
Others	13

(Uesugi)

9.2 Arrowheads

(Figures 7.170, 7.172, 7.173)

The excavations yielded seven specimens of copper arrowheads, among which two are complete and five are fragmentary in nature. All the specimens are V-shaped with a flat and thin section. In M-8, the proximal end is sharply V-shaped, whereas that of M-7 is curvilinear. These two complete specimens measure 1.7 cm to 3.1 cm in length, 1.5 cm to 1.7 cm in width and 0.1 cm to 0.2 cm in thickness. The other five specimens seem likely to have had similar shapes.

Five specimens come from Phase 5 of the Central Area and one is from Phase 4 of the East Area.

(Uesugi)

9.3 Spearheads

(Figures 7.170, 7.173)

One complete specimen of a spearhead was found in Phase 5 of the Central Area. It has an elongated, tapering body with bulging sides towards the proximal end and a narrow tang with a square section. It measures 25.8 cm in length, 1.2 cm to 5.5 cm in width and 0.2 cm to 0.4 cm in thickness near the distal end. The thickness is bascially quite even, but it has a low vertical ridge in the centre.

(Uesugi)

9.4 Axes

(Figures 7.170, 7.174)

Two specimens of flat axes (M-12, M-13) were found in the excavations. Both are distinguished by a flat rectangular shape, measuring 7.3 cm to 8.1 cm in length, 5.0 cm to 5.8 cm in width and 0.5 cm to 0.6 cm in thickness. They show damage on their blade. In 08-1053, the distal end is slightly bent. One specimen comes from Phase 3 of the Central Area and the other from Phase 4 of the East Area.

(Uesugi)

9.5 Chisels

(Figures 7.170, 7.175)

Three specimens of chisels were found in the excavations. All the specimens are rods with a square section and a blade on one end. 013 is well preserved, maintaining its original shape which has a slightly wider proximal end. They measure 8.7 cm to 10.2 cm in length, 0.6 cm to 1.0 cm in width of the body and 0.5 cm to 1.1 cm in width of the blade, and 0.4 cm to 0.8 cm in thickness. All come from Phase 5 of the Central Area.

(Uesugi)

9.6 Points

(Figures, 7.170, 7.175, 7.182)

Two specimens of points were retrieved from the excavations. M-19 is bent in the centre and has a pointed end. It is circular in section. It measures 4.5 cm in length and 0.2 cm in section diameter. M-18 has a straight profile having a circular section and a pointed end. It measures 5.3 cm in length and 0.3 cm in section diameter. Both specimens come from Phase 2 of the Central Area.

(Uesugi)

9.7 Hook

(Figures 7.170, 7.176)

Six specimens of hooks were found in the

Table 7.58 Area-wise stratigraphic distribution of copper bangles

	Total	***Central Area***	***East Area***	***West Area***	***Northwest Area***	***North Extension***	***North Area***	***Kiln Area***	***Surface***	***Total***
Surface	9	9	0	0	0	0	0	0	0	9
Phase 5	0	0	0	0	0	0	0	0	0	0
Phase 4	3	0	2	0	0	1	0	0	0	3
Phase 3	1	1	0	0	0	0	0	0	0	1
Phase 2	0	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0	0
Total	13	10	2	0	0	1	0	0	0	13

Table 7.59 Area-wise stratigraphic distribution of copper rings

	Total	***Central Area***	***East Area***	***West Area***	***Northwest Area***	***North Extension***	***North Area***	***Kiln Area***	***Surface***	***Total***
Surface	0	0	0	0	0	0	0	0	0	0
Phase 5	7	7	0	0	0	0	0	0	0	7
Phase 4	3	0	2	0	0	0	1	0	0	3
Phase 3	0	0	0	0	0	0	0	0	0	0
Phase 2	2	0	0	0	2	0	0	0	0	2
Phase 1	0	0	0	0	0	0	0	0	0	0
Uncertain	1	0	0	1	0	0	0	0	0	1
Total	13	7	2	1	2	0	1	0	0	13

Table 7.60 Area-wise stratigraphic distribution of copper rods

	Total	***Central Area***	***East Area***	***West Area***	***Northwest Area***	***North Extension***	***North Area***	***Kiln Area***	***Surface***	***Total***
Surface	0	0	0	0	0	0	0	0	0	0
Phase 5	13	13		0	0	0	0	0	0	13
Phase 4	5	0	4	0	0	1	0	0	0	5
Phase 3	2	1	0	0	0	0	1	0	0	2
Phase 2	1	0	0	0	1	0	0	0	0	1
Phase 1	1	0	0	0	1	0	0	0	0	1
Uncertain	2	0	0	0	2	0	0	0	0	2
Total	24	14	4	0	4	1	1	0	0	24

Table 7.61 Area-wise stratigraphic distribution of indeterminate copper objects

	Total	***Central Area***	***East Area***	***West Area***	***Northwest Area***	***North Extension***	***North Area***	***Kiln Area***	***Surface***	***Total***
Surface	0	0	0	0	0	0	0	0	0	0
Phase 5	10	9	0	0	0	1	0	0	0	10
Phase 4	1	0	1	0	0	0	0	0	0	1
Phase 3	1	1	0	0	0	0	0	0	0	1
Phase 2	1	1	0	0	0	0	0	0	0	1
Phase 1	0	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0	0
Total	13	11	1	0	0	1	0	0	0	13

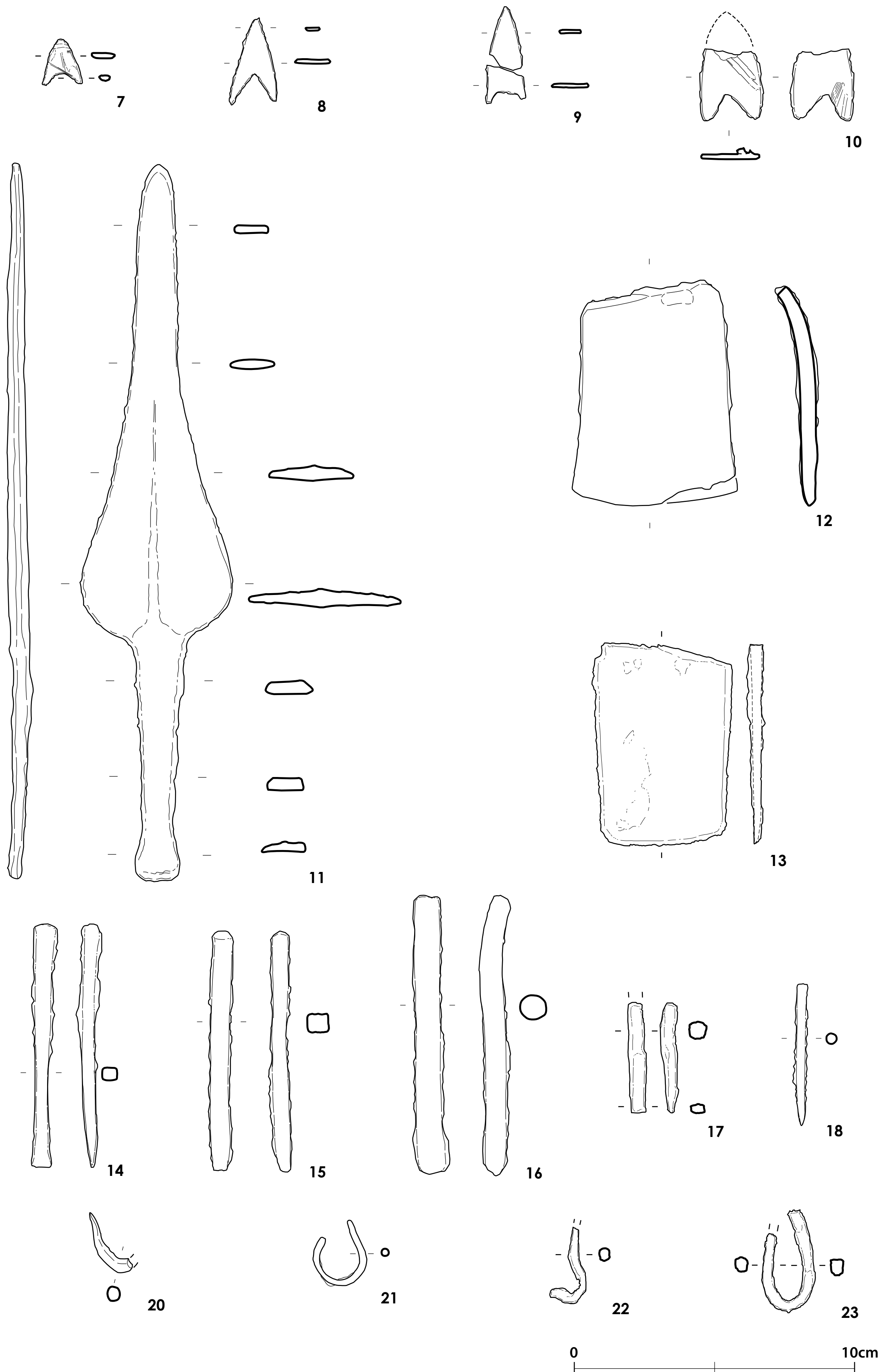


Figure 7.170 Copper/bronze objects (1:2)

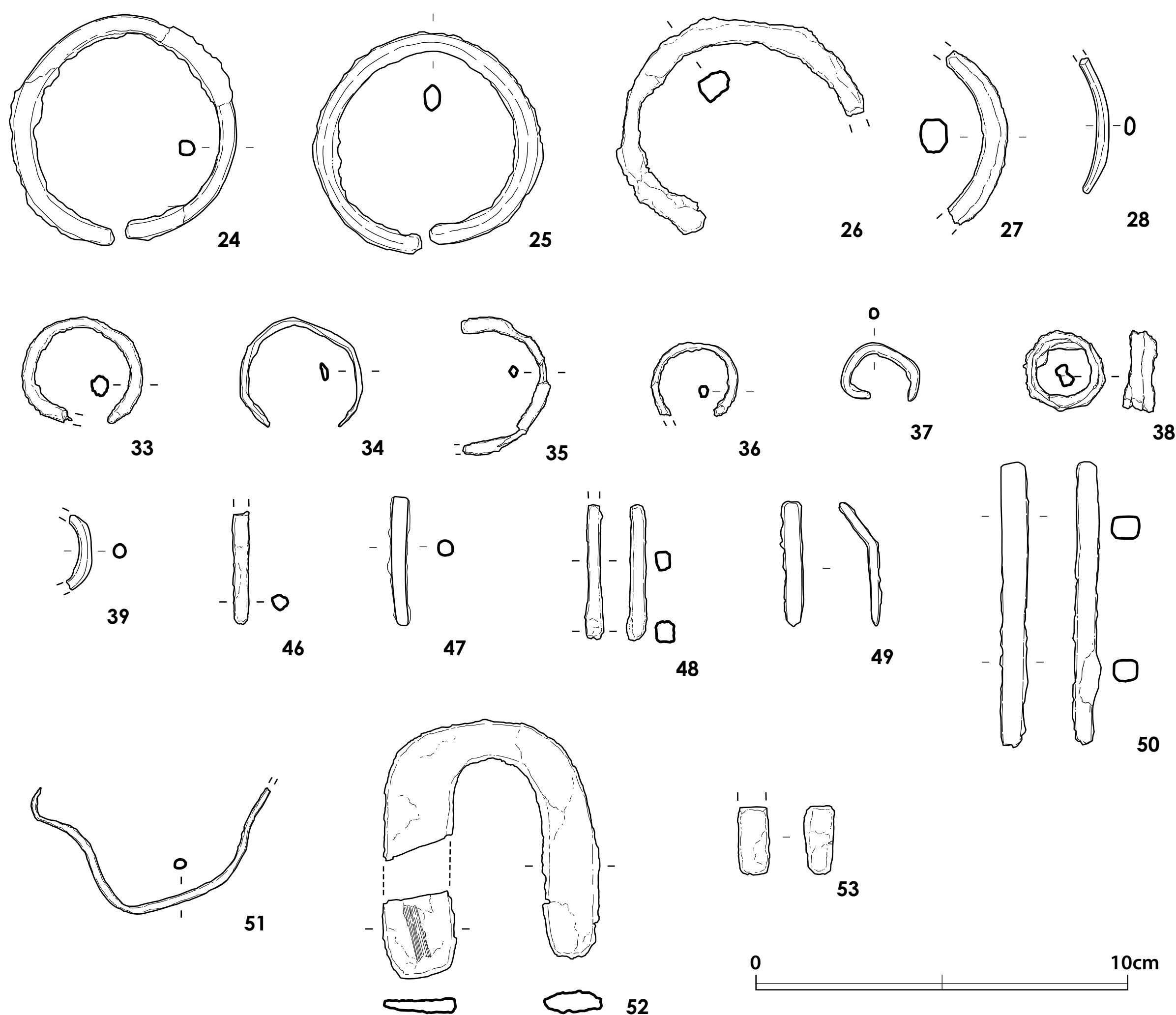


Figure 7.171 Copper/bronze objects (1:2)

excavations. Of them two specimens (M-20) are fragments but have a curved body and a pointed end. M-21 has a curved end. Two specimens (M-22 and one unillustrated) are made by bending rods into a U-shape.

Three specimens come from the Central Area (one from Phase 3 and two from Phase 5), one from the East Area (Phase 4), and two from the North Extension (Phase 4).

(Uesugi)

9.8 Bangles

(Figures 7.171, 7.177 - 7.180, Table 7.58)

13 specimens of copper bangles were unearthed in the excavations. Only two specimens (M-24, M-25) are complete while the rest are fragmentary in nature. The complete specimens preserve their entire shape with an opening, indicating that they were made by bending a rod into a circular shape. They are circular or oblong in section. In M-29, the body is twisted.

They measure 6.0 cm to 6.5 cm in external diameter. One specimen (M-32), though highly fragmented, is noteworthy in that it is inlaid with steatite micro-beads.

10 specimens come from the Central Area (one from Phase 3 and nine from Phase 5), two from the East Area (Phase 4), and one from the North Extension (Phase 4).

(Uesugi)



Figure 7.172 Copper/bronze arrowheads (1:1)



Figure 7.173 Copper/bronze spearhead (1:2)



Figure 7.174 Copper/bronze adzes (1:1)



Figure 7.175 Copper/bronze objects (1:1)



Figure 7.176 Copper/bronze objects (1:1)



Figure 7.177 Copper/bronze bangles (1:1)



Figure 7.178 Copper/bronze bangle (1:1)



Figure 7.179 Copper/bronze objects (1:1)



Figure 7.180 Copper/bronze bangle with steatite micro-beads inlay (1:1)



Figure 7.181 Copper/bronze objects (1:1)



Figure 7.182 Copper/bronze objects (1:1)



Figure 7.183 Copper/bronze object (1:1)

9.9 Beads

Three specimens of copper beads were found in the excavations, All specimens are short cylindrical in shape and small in size measuring 3.0 mm to 8.0 mm in diameter and 2.0 mm to 4.0 mm in height. They all come from Phase 5 of the Central Area.

(Uesugi)

9.10 Rings

(Figures 7.171, 7.181, Table 7.59)

13 specimens of copper rings were unearthed in the excavations. Those with a smaller diameter that cannot be considered bangles are categorized here as rings. They measure 1.1 cm to 3.6 cm in external diameter. All the specimens are circular in section. One specimen (M-38) is double coiled.

Seven specimens come from the Central Area (Phase 5), two from the East Area (Phase 4), one from the West Area (uncertain phase), two from the Northwest Area (Phase 2) and one from the North Area (Phase 4).

(Uesugi)

9.11 Rods

(Figures 7.171, 7.175, Table 7.60)

24 specimens of rods were found in the excavations. Among them only one specimen is complete while the rest are fragmentary. The fragmentary specimens may be a parts of other objects. The complete specimen measures 7.9 cm in length, and has a square section of 0.8 cm in width and 0.6 cm in thickness. M-49 is bent in-between. Some of these rods may have been used for making chisels.

14 specimens come from the Central Area (one from Phase 3 and 13 from Phase 5), four from the East Area (Phase 4), four from the Northwest Area (one each from Phases 1 and 2, and two from a dump), one from the North Extension (Phase 4), and one from the North Area (Phase 3).

(Uesugi)

9.12 Horseshoe-shaped object

(Figures 7.171, 7.183)

One specimen of horseshoe-shaped object (M-52) was found in the excavations. It measures 6.7 cm in length, 5.9 cm in width and 0.3 cm in thickness. The ends are rounded. It comes from Phase 3 of the Central Area.

(Uesugi)

9.13 Wire

(Figure 7.171)

One specimen of copper wire (M-51) was found in the excavations. It is bent in an irregular shape. It measures 0.3 cm in section diameter. It comes from Phase 5 of the Central Area.

(Uesugi)

9.14 Others

(Figures 7.171, 7.182, Table 7.61)

13 specimens including tiny fragments are classified as indeterminate objects. One specimen of them is illustrated (M-53).

12 specimens come from the Central Area (one each from Phases 2 and 3 and nine from Phase 5), one specimen from the East Area (Phase 4) and one specimen from the North Extension (Phase 5).

(Uesugi)

10 IRON OBJECTS

10.1 Outline

(Table 7.62)

15 specimens of iron objects were retrieved from the excavations. They are comprised by the following forms. These iron objects are considered as belonging to the Historical period.

Ladle	2
Hook	1
Point	1
Ring	1
Rods	3
Slag	1
Tiny fragments	6

(Uesugi)

10.2 Ladle

(Figures 7.184, 7.185)

Two specimens of ladles were found in the excavations. Among them one specimen (M-74) is complete and another specimen (M-73) preserves only its handle. The complete specimen consists of a shallow and circular body and a long handle that is flat rectangular in section. It measures 30.2 cm in total length, 9.4 cm in diameter of the body, 2.8 cm in height of the body, 21.0 cm in length of the handle and 2.2 cm in width of the handle and 0.5 cm in thickness of the handle.

The handle fragment shows the same shape as that of the complete specimen, measuring 1.8 cm in width and 1.1 cm in thickness. It is probably rectangular in section. Both specimens were found in Phase 5 of the Central Area.

(Uesugi)

10.3 Hook

(Figure 7.181)

Only one specimen of a hook (M-68) was found in the excavations. It is curved into a hook shape. It is of circular in section. It measures 4.2 cm in intact length, 1.95 cm in width and 0.4 cm in section diameter. It comes from Phase 5 of the Central Area.

(Uesugi)

10.4 Point

(Figure 7.181)

One specimen of a point (M-70) was unearthed in the excavations. It is a fragment and round in section measuring 0.7 cm in diameter. It comes from Phase 4 of the East Area.

(Uesugi)

10.5 Ring

(Figure 7.181)

One specimen of an iron ring (M-69) was found in the excavations. It is fragmentary in nature. It is estimated to have had an external diameter of 2.0 cm. It comes from Phase 5 of the Central Area.

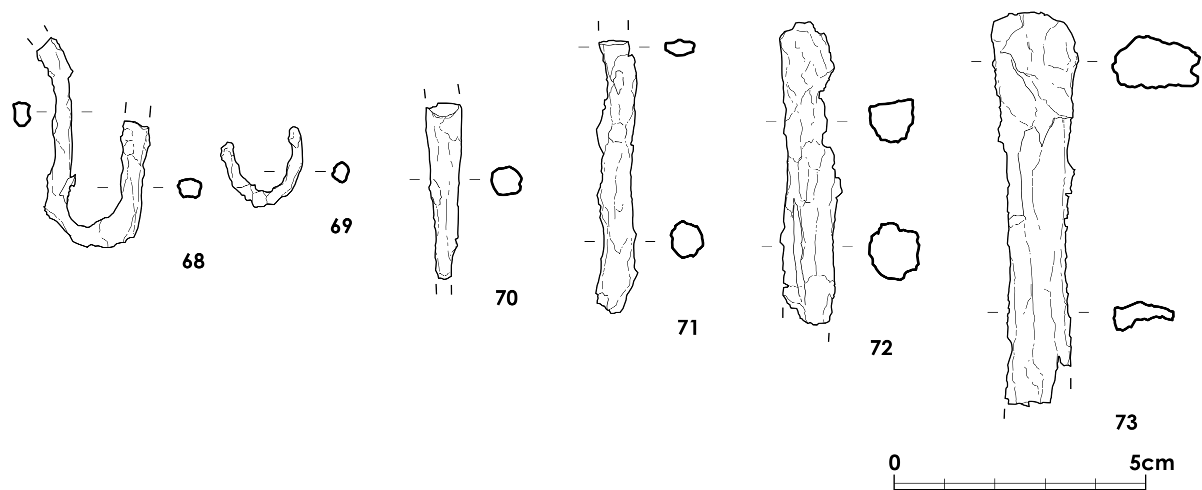
(Uesugi)

10.6 Rods

(Figure 7.181)

Four specimens of rods (M-71, M-72) were found in the excavations. All specimens are fragmentary in nature. They are of round in section. They all comes from Phase 5 of the Central Area.

(Uesugi)



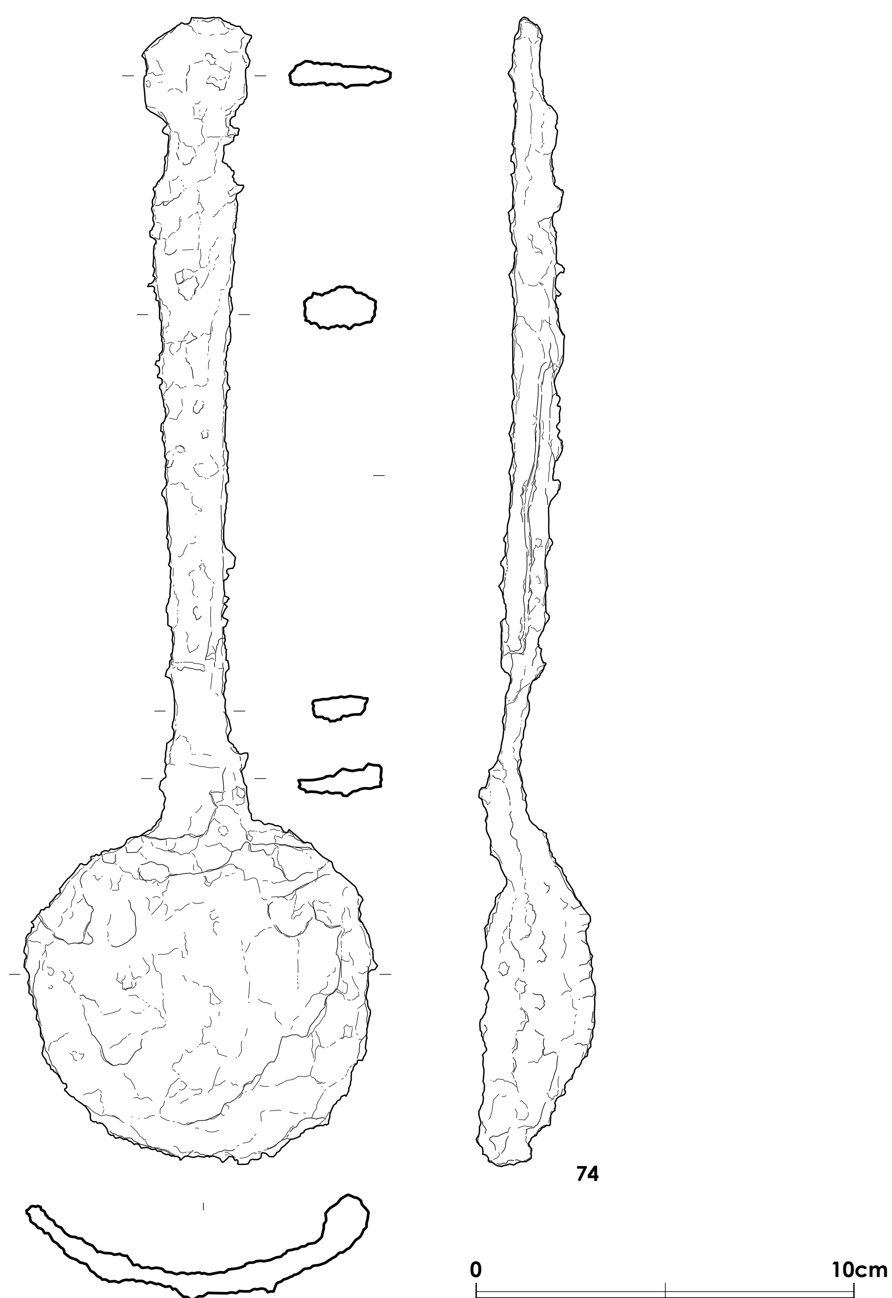


Figure 7.184 Iron objects (42 - 47: 2:3, 48: 1:2)



Figure 7.185 Iron ladle (1:2)

10.7 Slag

One specimen of slag was found in the excavations in Phase 4 of the East Area.

(Uesugi)

10.8 Tiny fragments

Five pieces of tiny fragments were found in the excavations. Their original shapes are uncertain. Three specimens come from Phase 5 of the Central Area and two from Phase 4 of the North Extension.

(Uesugi)

11 GLASS OBJECTS

11.1 Outline

58 specimens of glass objects were found in the excavations. The forms included are as follows.

Bangles	9
Beads	48

(Uesugi)

11.2 Bangles

Nine pieces of glass bangles were found in the excavations. In colour, one specimen is blue in and eight specimens are greenish. The blue one, a tiny fragment, comes from Phase 5 of the Central Area and the greenish ones were found in a dump of the Northwest Area. The former may belong to the Historical period whereas the rest may be of modern times.

(Uesugi)

Table 7.62 Area-wise stratigraphic distribution of iron objects

	Total	***Central Area***	***East Area***	***West Area***	***Northwest Area***	***North Extension***	***North Area***	***Kiln Area***	***Surface***
Surface	0	0	0	0	0	0	0	0	0
Phase 5	11	11	0	0	0	0	0	0	0
Phase 4	4	0	2	0	0	2	0	0	0
Phase 3	0	0	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	15	11	2	0	0	2	0	0	0

Table 7.63 Area-wise stratigraphic distribution of glass beads

	Total	***Central Area***	***East Area***	***West Area***	***Northwest Area***	***North Extension***	***North Area***	***Kiln Area***	***Surface***
Surface	0	0	0	0	0	0	0	0	0
Phase 5	35	35	0	0	0	0	0	0	0
Phase 4	12	0	9	0	0	1	2	0	0
Phase 3	2	2	0	0	0	0	0	0	0
Phase 2	0	0	0	0	0	0	0	0	0
Phase 1	0	0	0	0	0	0	0	0	0
Uncertain	0	0	0	0	0	0	0	0	0
Total	49	37	9	0	0	1	2	0	0

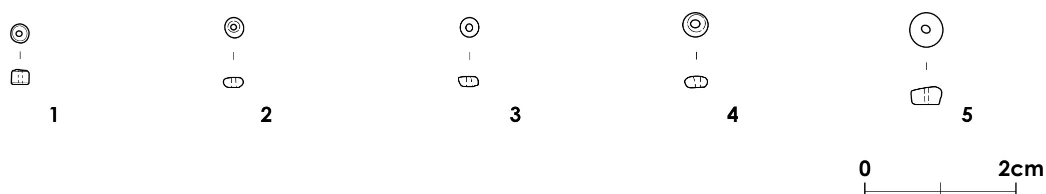


Figure 7.186 Glass beads (1:1)



Figure 7.187 Glass beads (1:1)

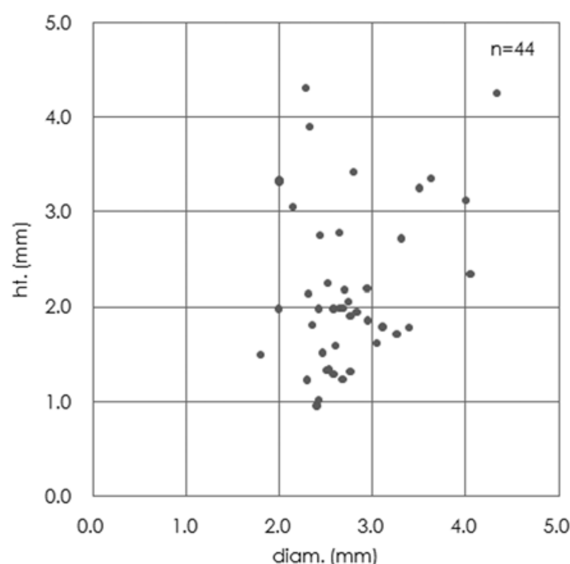


Figure 7.188 Size distribution of glass beads

11.3 Beads

(Figures 7.186 - 7.188, Table 7.63)

49 specimens of glass beads were found in the excavations. Among them 46 specimens are short cylindrical in shape measuring 1.8 mm to 4.33 mm in diameter and 0.96 mm to 4.31 mm in height. In colour, they vary from greenish, to bluish and black. Of the other two specimens, one specimen is a tiny fragment of blue colour and the other is translucent white sphere.

35 specimens come from Central Area (two from a Historical pit cut into Phase 3 in Trench 1C11, and 34 from Phase 5), nine from the East Area (Phase 4), one from the Northwest Area (Phase 4), one from the North Extension (Phase 4), and two from the North Area (Phase 4).

(Uesugi)

12 CONCLUSION FOR MINOR OBJECTS

Based on the observations of finds from the Settlement Area at Farmana, the following points can be summarized for understanding the importance of the site.

1) The finds from the site can be divided into Harappan objects and the Historical objects, based on the observation of the finds themselves. This chronological division can be reinforced by pottery and AMS dates from the site.

2) The spatial and stratigraphic distributions of each category of objects show no variation through the excavated areas and phases. In other words, the artefact assemblage and the formal features of objects exhibit no salient change through the entire period of occupation at the site. This is also common to the pottery from the site.

3) The materials used in artefacts found at Faramana are basically the same as those from other Harappan sites as a whole. They consist of terracotta, stone, bone, shell, gold and copper. The variety of artefacts also shares the basic features with those from other sites.

4) In locating the site of Farmana in the entire Harappan society, steatite seals, ornaments of various materials like stones, faience, shell and gold, and copper objects are of special significance, as they are distributed over the Greater Indus valley regardless of uneven distributions of material sources. The pervasiveness of these artefacts clearly indicates an expansion of socio-cultural networks covering the entire Grater Indus valley. The finds from Farmana demonstrates that the socio-cultural networks had reached as far as the eastern Ghaggar plains. As it is highly likely that the expansion of socio-cultural networks stood on strategic importance of each region which was included in the networks, the finds from Farmana provide an important clue for better understanding the strategic significance of the Ghaggar plains. In other words, the nature of the Harappan networks can be better understood by the updated corpus of finds from individual sites like Farmana.

5) In regards to the Historical objects, those which can date to the Gupta period are dominant among the finds from excavations, but one specimen of animal figurine clearly points to a date in the Mauryan-Sunga periods. Together they demonstrate that the site was reoccupied some time during the Early Historic period after the desertion of the Harappan settlement and that the settlement was occupied for several hundreds of years. The eastern Ghaggar plains was strategically important in that this area bridged the Ganga plains to the east and the entire Ghaggar plains and Punjab plains to the west. Although this importance is not confined to the Historical period, it seems likely that this region played an important role in the Historical period as well. The finds from Farmana, although they have limitations in amount and context, are regarded as relevant to our understanding of the North Indian society during the Historical period.

(Uesugi)

Acknowledgements

We would like to express our gratitude for Prof. V. Shinde (Deccan College) to give us an opportunity to work on the minor artefacts from Farmana. We also thank Prof. J.M. Kenoyer for giving us a number of advices on the Harappan artefacts and for preparing a note on the SEM images of bead holes. Mr. Gregg Jamison gave us comments on the SEM image of seal impressions. Dr. R.W. Law and Dr. M. Ameri kindly read through the drafts and gave us a helpful suggestions.

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CHAPTER 8

HARAPPAN CEMETERY AT FARMANA

by Vasant Shinde

1 INTRODUCTION

The first site where Harappan burials were discovered and excavated was the site of Harappa, the type-site of the Harappan Civilization. Two burial grounds, or cemeteries were identified: Cemetery R 37 belonging to the Mature Harappan Period and Cemetery H belonging to the Late Harappan Period. Cemetery H came to light in 1927 due to natural weathering of the cemetery's surface, which had exposed some of the jars interred with the burials. Cemetery R 37 was discovered accidentally by Sastri in 1937 (Sastri 1965).

Cemetery R37

This Mature Harappan burial ground is located to the south of Mound AB. It was accidentally discovered by Sastri in 1937, who subsequently conducted excavations in the cemetery. Large scale excavations at Harappa in 1938 and 1939 also exposed a number of R37's burials, and Wheeler conducted further excavations in 1946 in order to determine its stratigraphical position in relation to the rest of the site.

In Cemetery R37, bodies were buried in grave pits measuring 10 to 15 feet in length, 2.5 to 10 feet in width and 2 to 3 feet in depth. The width of the pit was greater towards the head in order to accommodate funeral pottery. The average number of the ceramics included in the graves varies between 15 and 20 (Sastri 1965). Other associated grave goods consist of necklaces of steatite beds, steatite beads, paste beads, anklets of paste beads, copper earrings, finger rings, shell bangles etc. Apart from these, a few toilet objects have also been recovered, including a tanged copper mirror, mother-of-pearl shells, an antimony rod and a shell spoon (Wheeler 1947).

The pottery associated with the burials is similar to those found in the habitational area. The shapes includes offering stands, goblets with pointed bases, jars of different shapes and sizes with different rim projections, cylindrical vases, carinated vases, pedastooled vases, dishes, cups, and lamps with perforated handle, caskets, lids etc. The paintings on the pottery include geometrical designs as well as naturalistic designs (Sastri 1965).

Apart from Cemeteries R37 and H, another area was identified as a burial area. This burial was found in Area G. Here, a large number of skeletal remains were found mixed with funeral pottery. The whole complex consists of multiple burials belonging to the early period. It includes 20 complete human skulls, skull fragments, 10 lower jaws, and parts of vertebral columns, hipbones, leg bones, arm bones, animal bones and pottery. Within the ceramics, goblets with the pointed bases dominate the assemblage. Personal ornaments are completely missing in this area (Sastri 1965).

The skeleton remains found from both the excavations were studied by Anthropological Survey India, whose report was published in 1962. The results of the Anthropological Survey of India show that "the population of Mature Harappan culture (Cemetery R 37) was long-headed of which one type was tall,

rugged and sturdy-built, having pronounced eye-brow ridges, receding fore-head, broad nose with depressed root....other was gracile, comparatively shorter, finer and weaker" (Gupta *et al.* 1962:177).

There is difference in the cranial capacity of the skeletons of Cemetery R37 and Cemetery H. The cranial index of the individuals interred in R37 is lower than those from Cemetery H, indicating that those buried in R37 were more long-headed and narrow-faced than those from Cemetery H. There is also a difference in the height of the individuals. In Cemetery H, the population with round-headed features is also present, though they are completely absent in cemetery R 37. This indicates that the Cemetery R37 population was more homogenous than that of Cemetery H (Gupta *et al.* 1962).

The renewed excavations at the site of Harappa, conducted by the University of California, Berkeley (UCB) from 1986-1990, have shed more light on the Cemetery R37 burials and on the material goods that accompanied the dead. This excavation brought to light 90 burials. The burials have been divided into three different groups based on context. The primary context burials are in distinct rectangular pits oriented from north to south. There are different modes of burials. In one burial mode, the body was placed in an extended and supine position, with its head towards the north and leg towards the south. Some of the burials had traces of wooden coffins with a lid made of reeds or wood. At several places there is evidence that the Harappans themselves cleared existing graves to make space for a new burial. This is evident because the "fill in every grave shaft contains broken pottery, isolated fragments of human bone, often complete bones" (Dales and Kenoyer 1991:206). This type of burials is often referred to as "being in secondary context/fill in order to distinguish from actual secondary burials" (Dales and Kenoyer 1991: 206). The secondary burials are those found on the eroded surface of the cemetery. The burials were accompanied by various grave goods, the most common being pottery. The pots were placed near the deceased's head and foot. Sometimes pottery was placed in the grave and covered with soil before the body was placed on top of it. In some cases the pottery is kept at the level of body. A distinctive surface treatment was used on the pottery that has been recovered from the graves; it has a coating of clay like material in order to prevent the decoration of the pot. Apart from ceramics other antiquities, other grave goods include shell bangles especially in the hands of females, copper rings, steatite disc beadss, steatite microbeads and beads of carnelian, lapis and jasper and black stone amulets (Dales and Kenoyer 1991).

Cemetery H

This cemetery is located in the low-lying area of mounds D and E. The exposures of embedded jars lead M.S. Vats to excavate this area in 1928. Large-scale excavations were again conducted in 1930-31 and 1933-34. The area was devoid of structures. On the basis of the mode of the burials, M.S. Vats divided them into two stratums, which were I and II (Vats 1974). Stratum I includes jar burials and Stratum II represents earth-burials with funeral pottery. It is located in the low-lying area of Mounds D and E.

Stratum I or Jar Burials

The jars of this stratum are dominated by round, ellipsoid and carinated forms. Some of the jars had neck-flanges perforated with three or four holes to support a lid; whereas some had brick support at their base. The height of the jars varies between 9.75 to 23.75 inches. The rounded forms of jars are either plain or painted. The painted jars are some times provided with ring-bases. "The plain jars have their bottoms roughened by tipping or grooving or with appliqué coat of clay while it was still wet" (Sastri 1965:3). These types of jars were used for burial of babies in an embryonic position (Wheeler 1947). The ellipsoid jars are characterised by a straight, rimless, collar-like neck with or without a flange (Sastri 1965:4). The finger

tipped pattern is absent in this variety. The carinated form jars belong to two varieties- plain and painted. The painted decorations are very simple, including bands, chevrons, fish, etc.

The bodies were put inside the pot at the bottom "the skull was placed on one side in contact with the wall of the urn, while the leg and arm bones were placed obliquely or horizontally crossing one another in various positions. In a good many cases the skull lay in the centre or a little eccentrically, and the long bones stood erect" (Sastri 1965: 4). The pots were too small to accommodate the complete skeleton, so most of the burials are fractional and have been labeled secondary burials. Sometimes the pot contains bones of more than one individual. The jars were then covered with inverted bowls, vases, flasks, lids, potsherds and bricks.

Stratum II or Earth Burials

These burials were found below the Stratum I jar burials. Most of the bodies were buried in the northeast to southwest orientation, whereas some were positioned from east to west and some from west to east. The bodies were laid sidewise with inflexed or extended legs. One skeleton was laid in a supine position. In most of the cases the arms were bent and the hands were in front of the face. In one exceptional burial, the deceased's forearms were crossed at the abdomen. The pottery associated with these burials "comprised a cocoanut-shaped long-necked water-jar often covered with a small flask, and offerings dish, shallow platters, plates-on-stand, flat covers and pear shaped flasks" (Sastri 1965: 8).

In some cases, animal bones were also found, such as in the grave of an adult male. Close to his body were found bones from sheep or goats. Rib bones were in the hands of the skeleton. Apart from jar burials and earth burials, Cemetery H includes fractional burials. They were found in the western section of the Cemetery H below the jar burials of Stratum I.

The scientific analysis carried by Hemphil, Lukas and Kennedy (1991) on the skeletal remains from this cemetery indicates that the young to middle-aged adult population dominated the cemetery, whereas children, juveniles and older population form a lesser group in the formation of the cemetery. Cranial measurements show that the Cemetery R37 population is biologically closest to the lower (earth) burials from Cemetery H (H2) and the post-Harappan Timargarha. It also indicates that there is not a close relationship between two Late Harappan Cemetery H samples. ".... data suggest that Harappan phase individuals- and by extension the inhabitants of chalcolithic Mehrgarh and post-Harappan Timargarha –bear closest affinities to populations from the West, i.e., from the Iranian plateau and the Near-East" (Hemphill *et al*. 1991: 174). "The Harappan Civilization does indeed represent an indigenous development within the Indus Valley, but this does not indicate isolation extending back to Neolithic times. Rather, this development represents internal continuity for only 2000 years, combined with interactions with the West and specifically with the Iranian Plateau" (Hemphill *et al*. 1991: 174).

Necropolis at Farmana

The site of Farmana is one of the few Harappan sites in Indian Subcontinent with a cemetery in its proximity. The Harappan Cemetery at Farmana was discovered accidently in 2007-08 season and a few burials (7 in all) were excavated at that time (Shinde *et al*. 2008b). A local landowner (Mr. Ramdhari from Seman village) was ploughing his land to lift the soil when he came across bones and burial pots, which he reported to students working on the excavation at the habitation site of Farmana. The prelimenary survey indicated that the cemetery was spread over a large area (approximately 3 ha). It is located 900 m to the northwest of the habitation site's datum point. It falls on the right side (north) of the Farmana-Seman road. Harappan cemeteries are usually located away from



Figure 8.1 General plan of excavated burials (1:250)

habitation, and have not been reported from every site. Undoubtedly, many cemeteries associated with Harappan sites have been overlooked or destroyed by agriculture or development projects. However, cemeteries have been discovered in association with many sites in the Ghaggar Basin, including Kalibangan, Rakhigarhi, Tarkhanewala Dera, Sanauli, Bedwa, and Putti Semen. It is now certain that the cemetery at Bedwa, Putti Seman and Sanauli belong to the Late Harappan period, while Kalibangan, Rakhigarhi and Tarkhanewala Dera have Mature Harappan cemeteries similar to the one found at Farmana. Unfortunately, archaeologists have been unable to identify cemeteries associated with most Harappan sites, or said cemeteries are found to be badly damaged. Farmana is the only site for which the entire burial site has survived, though some of the burials close to the surface have been damaged by ploughing.

To investigate burial customs and socio-religious aspects of Harappan culture, the team decided to excavate the Harappan Cemetery at Farmana on much larger scale in the season following its initial discovery. The team began working in the middle of December (17th), right at the start of the 2008-9 season. First, the team traced the outline of burial pits horizontally towards the north, east and west of the burials excavated in 2007-08. Next, 15 trenches measuring 7 m × 7 m were established in the cemetery area, the description of which is given in Chapter 4. In the future, the authors plan to undertake DNA, strontium, pathology, starch grain and residue analyses to understand the cemetery's demographics, along with health and diet of the people of the ancient site of Farmana.

The cemetery at Farmana was located in a natural

field. The burial pits were dug into the natural alluvium soil, which is brownish/yellowish in colour. The colour of the soil used to fill the pits after the deceased were interred turned greyish/blackish in colour, which is very easy to distinguish from the natural soil (Figure .. The dead bodies were placed in pits that varied in depth. Some to the pits are as deep as 1 m, some 50 cm and some very close to the surviving surface level. Some of the bodies were placed in a clay box (coffin) within their burial pits, the traces of which have survived. The remains of seventy burials were uncovered in an area of 35 m by 21 m. Burial Nos. 1-7 were excavated in the second season (2007-08) (Figure 8.1). A few burials were traced but not excavated.

The burial pits have three different orientations-northwest-southeast, north-south and northeast-southwest. The pottery and ornaments found in the burials makes it possible to identify their chronological sequence. The burials at the Harappan Cemetery of Farmana belong to three different sub-phases of the Mature Harappan. Burials belonging to Period-IIA (Early Mature Harappan Period) include more Early Harappan pots, particularly those of the Kot Diji type with round bodied, flat-based rimless or those with very little rim. Burials from Period-IIB (Middle Mature Harappan Period) include some Kot Diji type pots, some typical Harappan and a very few that belong to a local variety. The Burials of Period-IIC (Late Mature Harappan Period) lack Kot Diji pots, containing only those belonging to typical Harappan types along with the local pots. The ratio of Harappan to local pots in Period-IIC is nearly 50-50. The pottery and ornaments found in these burials clearly indicate that they are comparable with cemetery R-37 found at Harappa.

The burials found at Farmana can be divided into three categories- primary, secondary and symbolic. In the case of primary burials, the deceased was placed in a pit in a supine position, positioned with its head towards the north and legs towards the south. Primary burials therefore contain full skeletons in situ. Secondary burials usually contain only a few bones. It is likely that the bodies interred in secondary burials were kept in the open for some time. Later, the surviving bones were collected and buried in a pit ceremoniously. Some of the burials are devoid of any skeletal remains but contain pottery and ornaments. Such burials have been termed symbolic burials. In symbolic burials, it appears that the body of the deceased was not available, but those close to the deceased decided it was appropriate to ceremoniously inter burial items without it.

All of the the burial pits that were excavated are person-sized and rectangular in shape with their sides cut perfectly vertical and bottoms flat. Rectangular features are a hallmark of the site of Farmana as all of the pits dating to the Harappan period, including fire-pits, regardless of whether they are connected with the burial or habitation activity, are usually rectangular in shape. The number of pots and jewellery found in burial pits varied from burial to burial, possibly corresponding to the social and economic status of the deceased. The presence of burial goods suggests that the Harappans believed in life after death. The following contains descriptions of the burials excavated from the Harappan Cemetery at Farmana.

2 TRENCH PLAN IN THE FARMANA CEMETERY

A number of trenches were laid out in an effort to expose a large part of the Harappan Cemetery at Farmana. These trenches were located to the east, west, north and south of the burials (1-7) initially excavated in the 2007-08 season. The trenches in the cemetery measured 7 × 7 m. They were given labels that combine numerals with alphabetic symbols.

The alphabetical signs increase from east to west from the datum point. Numerical signs increase towards the north from the datum point. This method is similar to that used in the habitation area, except in the cemetery "C" was added as prefix to



Figure 8.2 Cross-section showing the different depth of burials



Figure 8.3 Cross-section showing the different depth of burials

the alphabetic symbols to differentiate cemetery from habitation. The datum point at the burial site is located 37.5 m to the east and 3.5 m to the south of the northern end of the ditch dug by the owner of the field for lifting soil. The numbering of the trenches accommodates all sides of the datum point though a majority of the trenches lie between the east-west and north-south line of the datum. One trench line each extends to the south and east of the datum line. Trench CA1 lies to the southeast corner of the datum line whereas CB1, CC1, CD1, CE1, CF1, CG1 and CH1lie to the south of the east-west datum line. Trenches CA2, CA3 and CA4 lie to the east of the north-south datum line. Trenches CB2, CC2, CE2, CF2, CG2 and CH2 are located to the west of the datum line. The next two lines of trenches, namely CB3, CC3, CD3, CE3, CF3, CG3, CH3, and CB4, CC4, CD4, and CE4, CF4, CG4, CH4, are to the north of the trenches located to the west of the datum point of the trenches mentioned above. CF2, CD3, CE3, CF3, CG3, CH3, CD4, CE4, CF4, CG4, CH4 were selected for excavation. A small portion of trench CG1 and CG2 was also excavated as the burial no 69 lies on the junction between them.

To determine how far the cemetery extends to the north, one trench 35 m to the north of CD4 to CH4 lines (CH10) was selected for excavation. This trench did not yield any remains. The main area selected for excavation seems to contain the densest concentration of burials. This year as many as 70 burials/burial pits have been discovered in an area measuring over 35 × 21 m (735 m2). Trench CE2 was excavated last year (2007-08).

The burials that were excavated in the 2007-08 season were oriented in two directions; pits ran in either the N-S or NW-SE direction. While most of the burials excavated in 2008-09 also followed this pattern, a few ran in the NE-SW direction. The burials that ran in the N-S direction include Nos. 1, 3, 4, 65, 66, 13, 32, 35, 38, 34, 39, 41, 44, 49, 50, 18, 55, 58, 62, 57, 68 and 69.

Burials running in the NW-SE direction include Nos. 2, 6, 7, 8, 9, 12, 14, 10, 24, 26, 27, 28, 29, 31, 11, 33, 40, 42, 43, 45, 46, 70, 47, 48, 21, 19, 52, 67, 15, 54, 53, 56, 64, 51, 61, 59, 63, 5, 6 and 9.

Burials that run in NE-SW direction include Nos. 22, 20 and 65.

All three types of burials run in all three directions. The following are descriptions of the burials excavated at the Harappan Cemetery at Farmana.

3 BURIALS OF PERIOD-IIA

In all, 6 burials belonging to this period have been excavated. Of these, 1 (No. 27) has two phases- the lower is symbolic and the upper is secondary. In the second phase, 2 of the burials are secondary and three are primary. All of the burials of this period are oriented in the NW-SE direction, the degree of which varies from burial to burial.

Symbolic Burial

Burial No. 27 (Tr. CF3)
(Figures 8.4 - 8.8)

This burial is located very close (25 cm) to the south of the northern section and 1.10 m to the east of the western section. This burial oriented 45° in the northwest to southeast direction and belongs to two different burial phases, I and II. Its burial pit is stepped, with an upper level and a lower level. The lower level contains a number of pots that are devoid of human bones. It belongs to Phase I and appears to be a symbolic burial. The pots were found at a depth of 85 cm from the surface level. The second burial phase (on the upper level) primarily consists of the leg bones of a fully-grown adult. They lay at a depth of 35 cm. This skeleton is not associated with any pottery. It therefore cannot be properly dated, but considering its stratigraphic level within the pit it appears to be associated with burial phase II. There are numerous

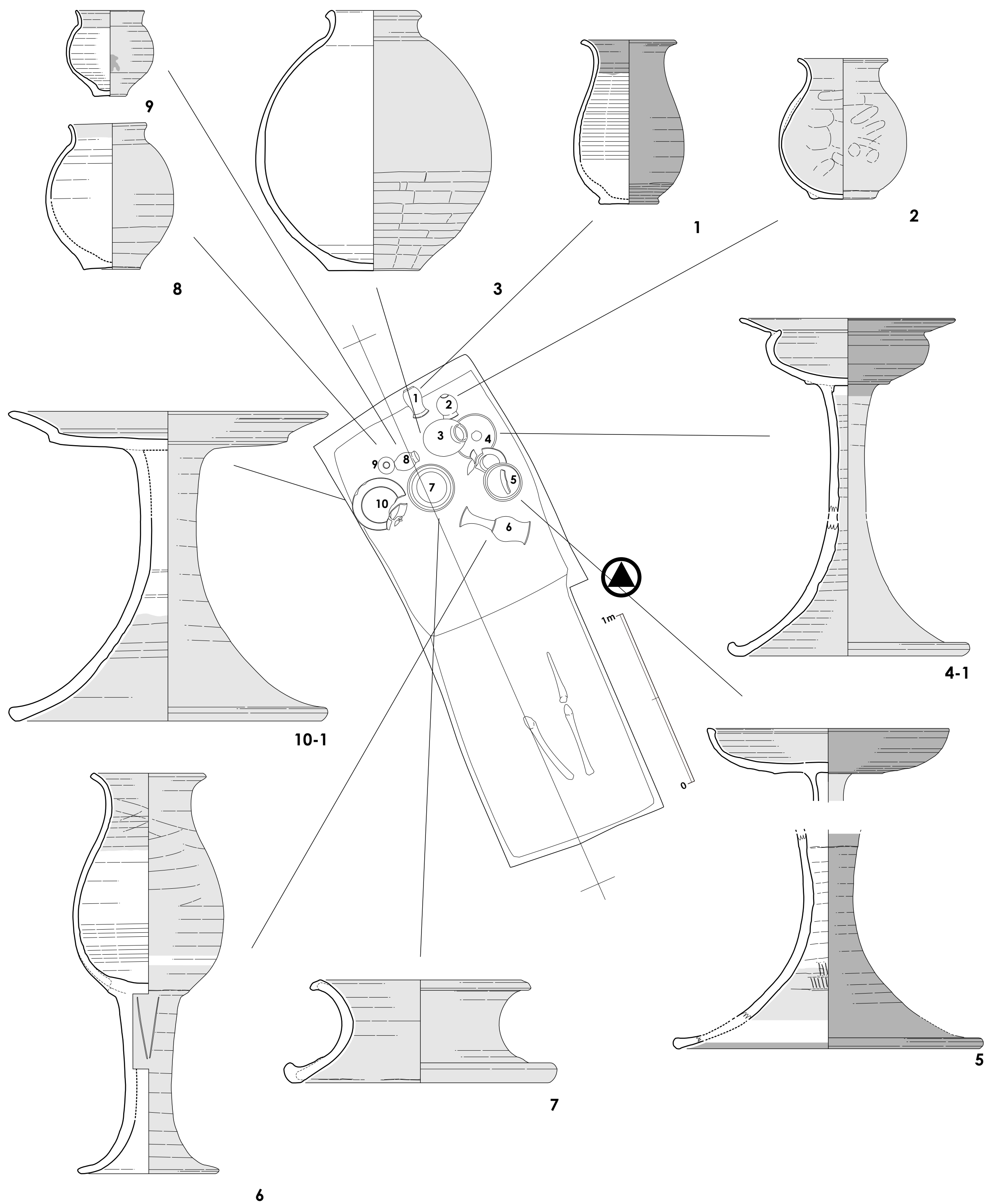


Figure 8.4 Plan of Burial no.27 (1:30)



Figure 8.5 General view of Burial no.27, from southwest



Figure 8.6 Details of Burial no.27



Figure 8.7 Details of Burial no.27



Figure 8.8 Details of Burial no.27

rodent holes inside the pit and it is likely that the upper part of the body was destroyed by rodents.

The burial pit is 2.75 m long and 1 m wide. It lacks any kind of clay lining.

The burial phase (Burial Phase I of No. 27) on the lower level of the burial consists only of pots found towards the northern part of the pit over an area of 1 m from north to south and 1 m from east to west. No human bones were found at this level. This burial is associated with the cemetery's earliest burial phase. Several pots belong to typical Harappan types, and one appears to be a typical Kot Diji pot. On the basis of these materials, the author has assigned this burial to the Early Mature Harappan Phase at Farmana. In all, 10 pots were found within this burial, of which two are of the coarse variety. The remaining pots belong to Classical Harappan varieties.

Pot No. 1, close to the northern section, is a miniature 'S' shaped jar. It is elongated (17 cm long), with a small dish base, narrow at the neck with an everted featureless rim. The diameter of the rim is 9.5 cm. It has fallen in the north to south direction with its mouth towards the south. To its southeast at a distance of 6 cm is a vase with globular body, flat base and short vertical neck and an everted rim. It is 15cm in length, but the diameter of the neck cannot be measured as the pot has fallen upside down. Immediately to the south of Pot No. 2 is Pot No. 3, which is a typical Kot Diji pot. It is a pear-shaped pot with narrow flat base and short everted round rim, 24 cm in height and a diameter of 10 cm at the mouth. It is slightly inclined towards the east. Pot No. 4 is a bowl-on-stand located immediately to the east of Pot No. 3. The stand is slender and tall (27 cm), flaring prominently at the base. The rim of the base is beaded. The bowl on the top is shallow and convex with an inner diameter of 13 cm, 6 cm deep in the centre. It has a flat, prominently projecting rim. The stand was found standing straight, but the bowl had broken and fallen on the southern side. Immediately to the south of the fallen bowl is a coarse red dish. It has a diameter of 24 cm, with a concave base a 3 cm high vertical periphery, which is flat on top. It has fallen in such a way that it slopes towards the west. This dish belongs to a local ceramic type and differs in form a typical Harappan dish. To the south at a distance of 7 cm from Pot No. 5 lies a unique vase-on-stand (Pot No. 6). It was found lying flat on the ground in northwest-southeast direction. Its stand is 18 cm in length and tubular with a small flared base that has a diameter of 15 cm. The vase on top is 22 cm in length and has a mouth diameter of 13 cm. It has an elongated body and prominent everted rim. It should be noted here that that the few specimens of vase-on-stands from Harappan were recovered only from burial contexts. They have not been found at the habitation site. It is quite likely that such forms were specifically manufactured as burial offerings. At a distance of 15 cm to the west of the fallen bowl-on-stand is a pulley-shaped pot rest. It has concave body and flared ends. The base of the pot rest has a beaded rim and is bigger in diameter than that of the upper part. The diameter of the base is 27 cm. The upper part of the pot rest has a diameter of 22 cm, the short rim of which curves outward. The total height of the pot rest is 10 cm. Immediately to the north is a typical Harappan 'pear' shaped goblet with narrow base, wide mouth and everted rim. This is Pot No. 8 and lies in the east to west direction with its mouth flaring toward the east. The total height of the goblet is 14 cm with a diameter of 8 cm. Immediately to its west is another goblet that is smaller than Pot No. 8. It has fallen upside-down. Its base is narrow and flat with a diameter of 4 cm. To the west of Pot No. 7 and 8 is a complete dish-on-stand, standing in its proper position. It has stepped sides with a diameter of 30 cm. The total height of the dish-on-stand is 28 cm. It has a short stem with a prominently flared base. The dish-on-stand and the bowl-on-stand found in this burial pit are typical of the Early Mature Harappan phase.

In addition to pottery, a bivalve shell was found inside the bowl portion of the bowl on stand. This may have been a spoon offering.

This burial probably belonged to a prominent

person whose dead body could not be retrieved but was given a ceremonious burial in accordance with his or her status. The higher status of the person is apparent in the number and variety of pots given as burial offerings.

The skeleton found at a depth of 35 cm in the upper level of the pit may belong to Period- IIA. The remains consist of two legs placed in a straight north to south line. The skeletons' feet converge. These remains have survived to a length of 80 cm. No burial goods were found associated with this skeleton. Considering its location and the attributes of the pit, this appears to be part of a primary burial. As mentioned earlier, the upper part of the body may have been completely damaged by rodents.

This is a unique context at the site. It consists of a single pit that was used for two burials, one above the other. It appears that while burying the dead body of the later person, the earlier burial pit was carefully opened and the body of someone who died some time later was carefully ceremoniously interred. It is quite likely that the later person was closely related to the person associated with the previous burial. Perhaps it was a spouse or close family member, buried along with someone who had died at an earlier time.

Primary Burial

Burial No. 28 (Tr. CG3)

(Figures 8.9 - 8.11)

This burial is located 2.30 m east of northeast peg of CG2 and 70 cm to the north of the southern trench line of CG3. The deceased was probably a child, oriented 15° in the northwest to southeast direction. The burial belongs to Burial Phase I of the Early Mature Harappan period. The burial pit is 2.10 m long and its average width is 63 cm. the pit has survived to a maximum depth of 40 cm. this burial lacks a clay box. Inside the burial pit was the primary burial of a child, few bones (lower mandible cervical, clavicle, shoulder bones, ribs, left hand and left tibia, fibula) of which have survived due to rodent activity (a rodent pit is apparent at the base of the burial pit). The total length of the child's remains is 93 cm. The body was placed in a supine position with legs and hand straight towards the south.

To the north of the head are 7 pots, which were included as burial goods. They are found over an area of 70 cm north to south and 45 cm from east to west, mostly along the western edge of the pit. All of the pots are of red variety. Pot No. 1, located 50 cm to the south of the northern end of the pit and 20 cm west of the eastern section of the pit, is a typical, Kot Diji globular pot of medium size. The pot broadens slightly towards its base, which was probably round, and has a vertical slightly everted rim. It is 15 cm in length with a rim diameter of 10 cm. The pot is inclined towards the east. To its southwest is another Kot Diji pot, labelled Pot No. 2. It is a pear shaped pot tapering at both ends with a blunt carination 6 cm above its base. It has short vertical everted rim and a prominent disc base. It is 18 cm in height and the diameter of the mouth is 8.5cm. The pot has fallen flat towards the south. Pot Nos. 3 to 7 are arranged along the western section in the north to south direction. Pot No. 3 is a lid that is thick in section with a deep concavity in the centre. The diameter of the lid is 20 cm. Inside the lid is a classical Harappan beaker, which is almost cylindrical with slightly tapering but flat base. It has a featureless vertical rim. It is 13 cm in height with a mouth diameter of 8 cm. This is Pot No. 4, which has fallen towards the south. Pot No. 5, to the north of Pot No. 4 on a slightly higher level, is a typical Kot Diji type pot with a perfectly round body, pointed disc base and short vertical featureless rim. It is 15 cm in length with a mouth diameter of 8.5 cm. It has also fallen towards the south. This pot was found inside Pot No. 6, which is a large lid. As a major portion of this lid underlies Pot Nos. 5 and 7, its dimension cannot be measured. Pot No. 7, which lies to the north of Pot No. 5, inside the lid (No. 6), is a typical globular Kot Diji type pot with round

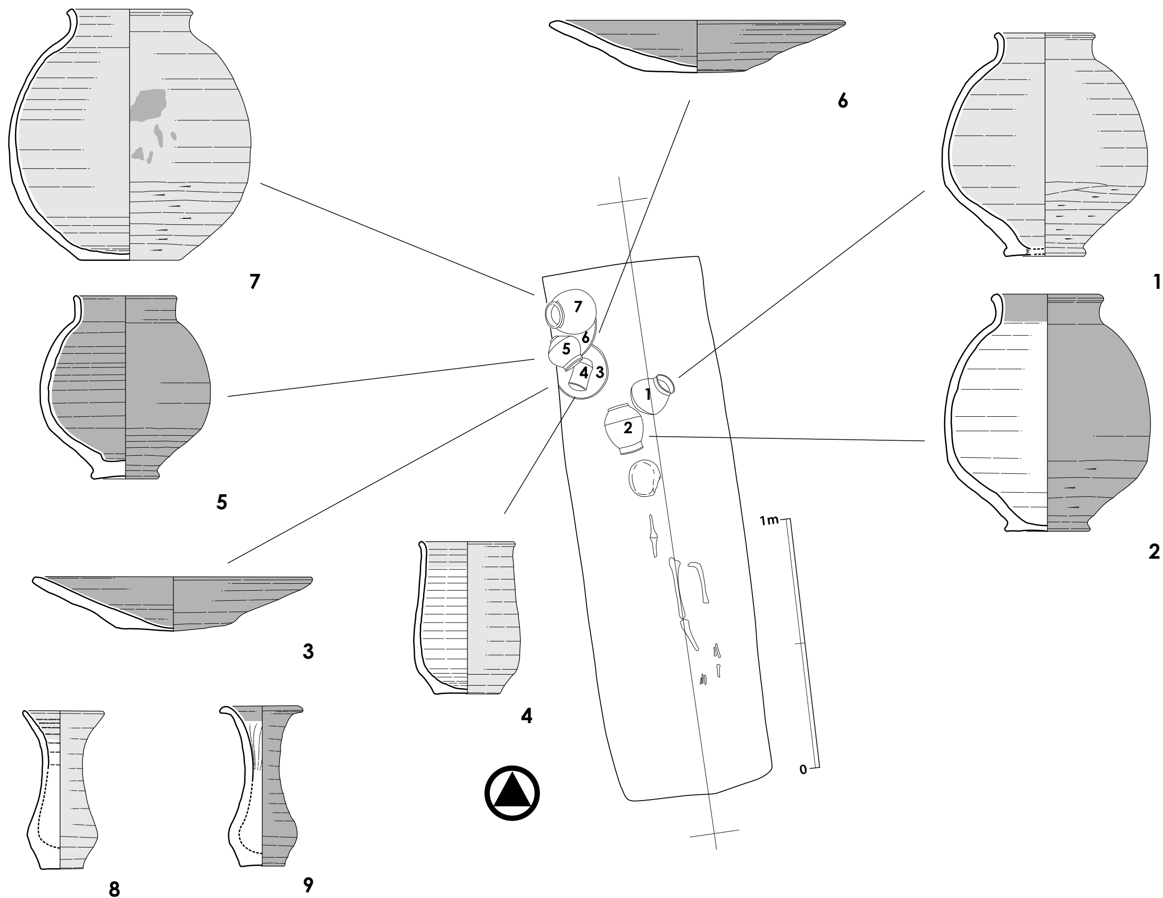


Figure 8.9 Plan of Burial no.28 (1:30)

bulbous body with a slightly elongated flat base and short vertical beaded rim. It is 20 cm in height with a mouth diameter of 10 cm.

As this burial contains many classic Harappan pots, it probably belonged to a childe who possessed a higher status in the community.

Burial No. 32 (Tr. CH3)

(Figures 8.12 - 8.14)

Burial No. 32 is located along the margin of eastern trench line of CH3. It is 2.20 m to the south of the northern section. The burial is oriented 10° in the northwest to southeast direction and belongs to Burial Phase I of the Early Mature Harappan Period. This is one of the best-preserved burials, and the deepest that was excavated at the site. It has the longest burial pit (2.85 m from north to south) and an average width of 80 cm. Its pit has survived to a maximum depth of 1.15 m. It is devoid of clay lining. The skeletal remains inside the pit are oriented slightly northwest to southeast. The left leg touches the southern section of the pit. This is a typical primary burial, but due to rodent activity a portions of the mandible, clavicles, right shoulder, left radius and ulna, and right humerus have been badly damaged. The remains belong to a fully-grown adult, intact to a length of 1.60 m. The tarsals of both legs have been turned in opposite directions. The body was placed in a supine position with both legs and hands placed straight towards parallel towards the south. The body's head is tilted towards the west. Both legs, including patella and lower extremities, are well preserved. The bones of the torso, including left shoulder and humerus and right radius, along with almost all the vertebra are well preserved. The pelvis bones are complete and in a good state of preservation. It appears that the head was placed on slightly higher ground. Most likely, a clay stem was used to elevate the head. It was found 13



Figure 8.10 General view of Burial no.28, from south



Figure 8.11 Details of Burial no.28

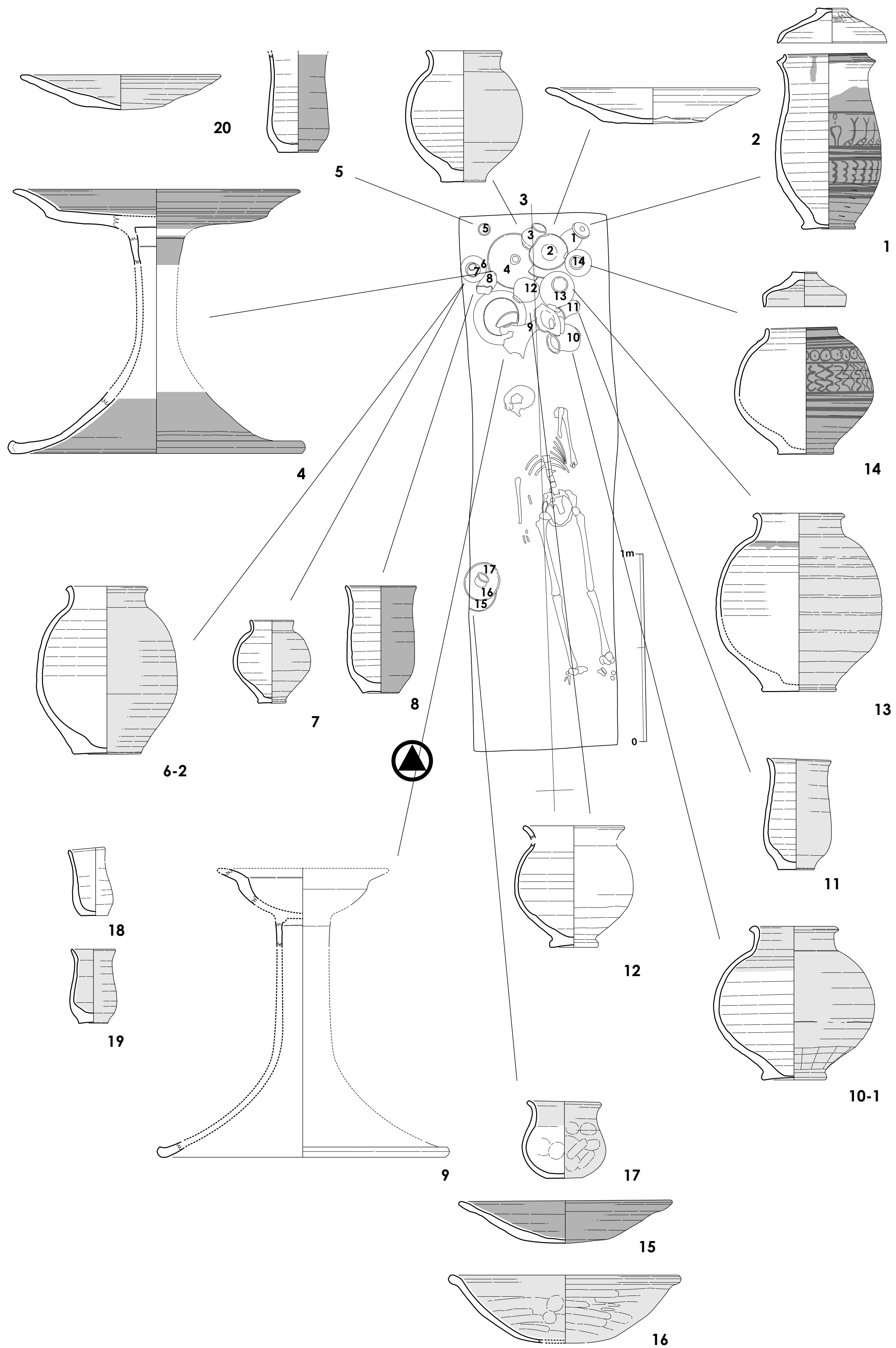


Figure 8.12 Plan of Burial no.32 (1:30)



Figure 8.13 Burial no.32



Figure 8.14 Burial no.32

cm higher than the rest of the skeleton.

To the north of the skeleton's head over an area of 75 cm from north to south and 65 cm from east to west were found 15 burial pots, including a small lid and bivalve shell spoon. There were also three pots at a distance of 26 cm west of the leg joints. These pots were on slightly higher ground. The pots on the northern side of the skeleton belong to the same level as the skeleton. These pots were found scattered over the empty space between the skeleton's head and the boundaries of the pit on the northern side.

Pot No. 1, which is located in the northeast corner, is a classical Harappan 'S' shaped jar. It is small in size (exposed length is 16 cm). It has a 'S' shaped profile with an everted rim possibly a flat narrow base, which was not visible when the burial was exposed. The diameter of the mouth of the pot is 10 cm. It is almost vertical, slightly inclined towards the east. The pot was covered by a lid that fits its mouth. This lid has a pointed, flat knob. It resembles a shallow concave cup with vertical sides. It belongs to the slightly coarse red variety. Pot No. 2 is a slightly concave dish with a featureless rim. It has a diameter of 24 cm. It is made of slightly coarse material. The dish rested to the west of Pot Nos. 1 and 14, slightly tilted towards the south. Pot No. 3 is a classical Harappan pear shaped goblet with a pointed flat base and a short vertical featureless rim. It is 14 cm in height with a mouth diameter of 8 cm. It is located to the north of the dish (Pot No. 2), slightly tilted towards the northeast side. To its southwest is Pot No. 4, which is a large dish-on-stand. Its dish portion has been detached and has fallen flat towards its southern side. The belongs to a typical Mature Harappan type; it is step sided with a flat base. Its diameter is 30 cm. The stand has a very long stem (7 cm) and flared out base with a featureless rim. The diameter of the base is 30 cm. The shape of the dish-on-stand is typical of the Early Mature Harappan Period. Pot No. 5, which is located to the northwest of Pot No. 4, is a beaker, the upper part of which has been broken. It is almost cylindrical with slightly tapering flat base. The diameter of its flat base is 2 cm. As it is broken, the height and diameter of its rim cannot be measured. It was found standing vertical. Pot No. 6 and 7 are along the western section, north of the stand of dish-on-stand (Pot No. 4). Pot Nos. 6 and 7 are both globular pots with short everted rims. The only difference between them is that Pot No. 7 is a miniature variety of Pot No. 6, placed on top of Pot No. 6 to function as a lid. Pot No. 6 is 13 cm in height, the mouth diameter of which is 9 cm. Pot No. 7 is 6 cm tall with a mouth diameter of 5 cm. Both of the pots were found standing vertical facing upwards. Pot No. 8, located between Pot No. 6 and 4, is a broken beaker similar to Pot No. 5. It appears to be slightly larger in size than Pot No. 5. As this is also broken, the details of its height and diameter cannot be recorded. The pot has fallen in the northeast to southwest direction facing southwest. Pot No. 9 is a bowl-on-stand, part of which lies in the fallen dish of Pot No. 4. It is located to the south of Pot Nos. 12 and 13, having fallen towards the east. The bowl-on-stand has an inner diameter of 12 cm and a very long (6 cm) flat projecting rim. The bowl is 4 cm deep. Inside is a bi-valve shell with ground edge that must have been included as a spoon in the burial offerings. The total height of the bowl-on-stand is 25 cm. It has a small stem (9 cm) and flared rimless base. Pot No. 10, which lies to the east of Pot No. 9 is globular with a diameter of 6 cm. It has a disc base and a short vertical beaded rim. The upper part of the bowl-on-stand has fallen to the north of this pot. It is made of slightly coarse material and was found inclined towards the west. The pot is 17 cm tall with a mouth diameter of 10 cm. Pot No. 11 on the northern side of Pot No. 10 is a typical Harappan beaker, which was found slightly inclined on western side. Its upper portion is vertical and lower portion is roundish. It has a tapering flat base and wide mouth with an incipient everted rim. It is 13 cm tall, but the diameter of the rim cannot be measured as part of the bowl-on-stand has fallen onto it. Pot No. 12, which is between the dish portion of Pot Nos. 4. and 13, is a globular pot with a disc base. Its upper rim portion is

broken, so its height and length cannot be measured. It has fallen in the northwest to southwest direction with its mouth towards the northeast. Immediately to its east is a complete Kot Diji type pot, which was assigned Pot No. 14 and stands perfectly vertical. It has a round body and tapering flat base with a short vertical beaded rim. The height of the pot is 15 cm and the diameter of the mouth is 9 cm. To its northeast is another Kot Diji type, slightly smaller than Pot No. 13, with a perfectly round body and short everted rim. It is 12 cm tall with a mouth diameter of 8 cm. It was found standing vertical.

Three coarse red pots belonging to a local variety were found to the west of the body's leg joints. The lowest one is probably a concave lid with a featureless rim and flat base. It has a diameter of 20 cm. This is numbered Pot No. 15. Pot no. 16 was inside pot no. 15. It is probably a wide mouthed shallow basin with a thin section and slightly everted rim. It has a diameter of 23 cm and is 8 cm deep. Inside this bowl is a small lota like pot. It has squat globular body, concave neck and everted featureless rim. It is 7 cm tall and the mouth diameter is 8 cm. This was assigned Pot No. 17. Pot No. 16 and 17 were slightly inclined towards the northeast.

This burial was unique in that pots were found in both the northern part of the burial pit at a distance from the deceased and in the southern part of the pit close to its legs. Considering the larger size of the interred pots, their depth, and the number of classical Harappan and a few local pottery types, the socio-economic status of the person must have been quite high.

Burial No. 40 (Tr. CH 4)
(Figures 8.15 - 8.17)

This burial is located 25 cm to the east of Burial No. 39 and close to Burial No. 41, which in fact is a later burial. Due to the presence of the later burial, the lower extremities, which were hidden below the burial pit of 4C, could not be excavated. It was oriented 45° in the northwest to southeast direction. Considering the nature of the pot, the burial belongs to Burial Phase 1, a component of the Early Mature Harappan Period. The pit is located 1.75 m to the north of the southern trench line. It is perfectly rectangular but lacks a clay lining. It measures 2.50 m in length and 90 cm in width. It has survived to a maximum depth of 58 cm. This is a primary burial, though the skeleton above the pelvic region is missing. Only the pelvic bones, lower part of the right hand and both legs are present. Based on the surviving remains it appears that the dead body was placed in a supine position with both legs straight and parallel towards the south. The position of tarsals is not clear, as they underlie the southern part of Burial No. 41. Numerous rodent holes indicate that burrowing animals inflicted major damage on the skeleton. The exposed length of the legs measures 85 cm. The location of part of the left hand beside the upper part of right femur indicates that the hands were placed straight at the body's sides towards the south. The length of the skeleton's long bones and size of its pelvic bones seem to indicate that it belonged to a fully-grown adult. Note that the skeletal remains were found towards the southern end of the pit.

Towards the northern end 10 pots were found. They were scattered over an area of 60 by 60 cm towards the eastern section. Most of the miniature pots (Pot Nos. 2, 3, 4 and 5) were found placed inside a small basin which is numbered Pot No. 6. Also inside is a larger Kot Diji type pot. The 3 remaining big pots were not included in the basin.

Pot No. 1, which fell towards the northwest, is a typical Kot Diji type with a slightly tapering globular body and a flat base. It is 18 cm in height. Its mouth diameter is 10 cm. To its west is a small goblet type pot, the rim of which is broken and the lower portion still unexposed. It appears to be globular in shape with a small, everted rim. This pot is slightly inclines towards the north. This is numbered Pot No. 2. To its south in the north to south direction lies a Harappan

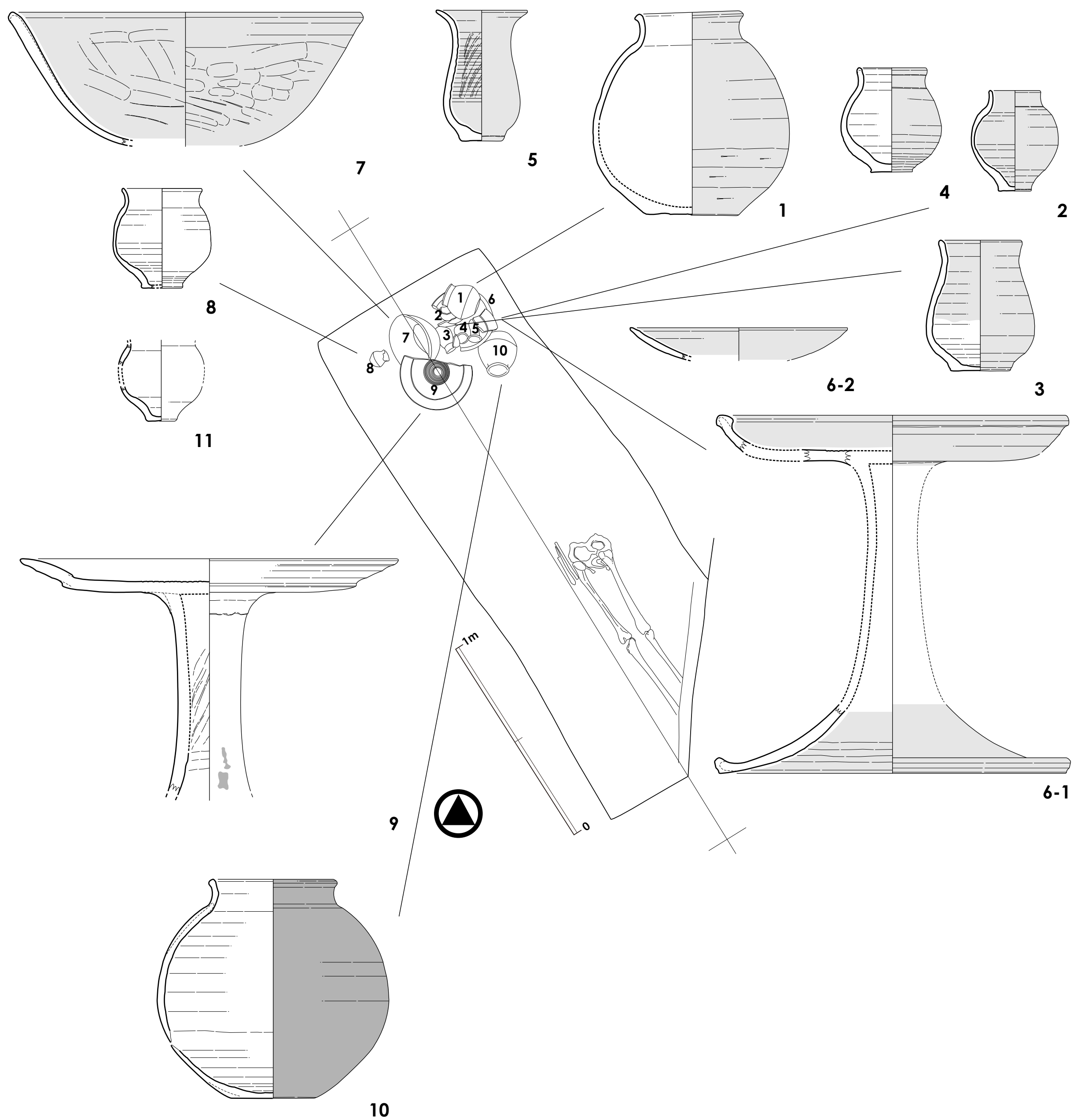


Figure 8.15 Plan of Burial no.40 (1:30)

beaker with its mouth facing south. It bulges slightly in its lower part with a vertical featureless rim and a prominent disc base. It is 12 cm in height. The mouth is hidden under a broken pot sherd from a dish-on-stand (Pot No. 9). To its east is a pear shaped goblet with a wide mouth and slightly everted rim. The pot is slightly inclined towards the south. The diameter of the rim is 6.5 cm. As the lower portion is embedded in the floor of the pit, the dimensions of its base and height are not clear. To it east is Pot No. 5, which is a beaker with a cylindrical body and flared rim. It has a flat base, which is not visible. The diameter of the mouth is 7 cm. This beaker is tilted towards the south.

The basin in which Pot Nos. 1 to 5 are located is shallow, probably with a flat narrow base. It is thick in section, slightly coarse, and has a diameter of 33 cm. Pot No. 7 is a medium sized deep basin with tapering sides, flat base and a featureless round rim. It tilts towards the west. It has a mouth diameter of 30 cm and is 15 cm deep in the centre. To its west is a small pear shaped goblet with a narrow disc base and short everted rim. It has fallen towards the east. It is 10 cm in height with a mouth diameter of 6 cm. Pot No. 9 is a dish-on-stand. As the dish is cracked and the stem



Figure 8.16 General view of Burial nos.40 and 41, from southeast



Figure 8.17 Details of Burial no.40

portion has not been excavated, an exact description is impossible at this time. The dish on top has typical Mature Harappan step sides with incised concentric circles in the centre. The diameter of the dish is 33.5 cm. To it east is Pot No. 10, which is exactly the same as Pot No. 1. It belongs to the Kot Diji type. As the lower portion is still embedded, its height cannot be measured. The diameter of its mouth is 10 cm. The pot inclines towards the southwest.

Considering the large size of the pit and the number of classical Harappan pots, the social standing of the deceased must have been quite high.

Secondary Burial

Burial No. 56 (Trs. CD4 and CE4)

(Figures 8.18 - 8.22)

This burial is located 20 cm to the east of Burial No. 55 and 90 cm to the south of the northern section of CE4. On the basis of the pottery inside the burial pit, this burial can be assigned to the Early Mature Harappan Period (Burial Phase I). It is oriented 30° in the northwest to southeast direction and lined with 20 cm of thick clay plaster. The pit is 2.90 m long and 70 cm wide. It has survived to the maximum depth of 60 cm. Burial No. 56 is a secondary burial consisting of a few long bones, hand bones and 11 pots, all of which were found in the northern end. The southern part of the pit is almost empty. A few long bones, including the right humerus, fragments of the left humerus and radius were found oriented in the northwest to southeast direction.

Pot No. 1 is a well-preserved shallow bowl located in the northeast corner of the pit. In situ., it faces upward. It has a diameter of 13.5 cm, and a depth of 5 cm in the centre. Inside the shallow bowl was a large bi-valve shell, which must have been offered as a spoon. It has a round base, flaring sides and featureless rim. Pot No. 2 is a Harappan goblet, located towards the southeast side of Pot No. 1. It has a round body, tapering towards the north, and a prominent everted rim. The lower portion remains embedded in the ground and hence the height of the pot cannot be measured and the shape of the base cannot be identified. Its mouth has a diameter of 9.5 cm. The pot is slightly inclined towards the east. To its northwest is Pot No. 3, which is a globular pot with a sloping shoulder and out-turned rim. Its total height is 15 cm and the diameter of its mouth is 10 cm. It was found standing vertical. Pot No. 4 is a large goblet with everted rim and flat base which is not easily visible. The diameter of its mouth is 11 cm. It has tilted to east. Pot No. 5, to the south of Pot Nos. 3 and 4, is a large dish-on-stand with a large stem and flared base with a featureless edge. The dish on top is broken, the fragments of which were found around the base portion. The stand is 35 cm tall. It was found standing vertical. Pot No. 6 is a miniature goblet. It was found to the east of the base of Pot No. 5. It has fallen to the southeast side. It has a round body and slightly concave neck, slightly everted rim and narrow base. It is 9.5 cm in height but the diamter of its mouth cannot be measured, as its major portion remains unexcavated. Pot No. 7 is to the northeast of Pot No. 6. It is similar to Pot No. 3 except that its rim is flat and projecting. It was found standing vertically. To the northwest of Pot No. 7 lies Pot No. 8. It is a globular pot with bulging body and probably flat base, short vertical neck, and flat projecting rim. Its lower portion resembles a Kot Diji pot. The diameter of its mouth is 11cm. The lower portion of the pot is still embedded in the floor of the pit. It is slightly tilted to the west. Pot No. 9 is to the northeast of Pot No. 8. It is a small Harappan goblet with an everted rim, the diameter of which is 7 cm. the lower half of the pot remains embedded in the pit. The pot stands vertical. To its west is Pot No. 10, which is similar to Pot No. 6 but slightly smaller in size. It has fallen to the east. Pot No. 11, which is south of Pot No. 2, appears to be a large Harappan goblet, the major portion of which is hidden under the dish from Pot No. 2. It has slightly tapering mouth and everted rim. It has fallen to the south.

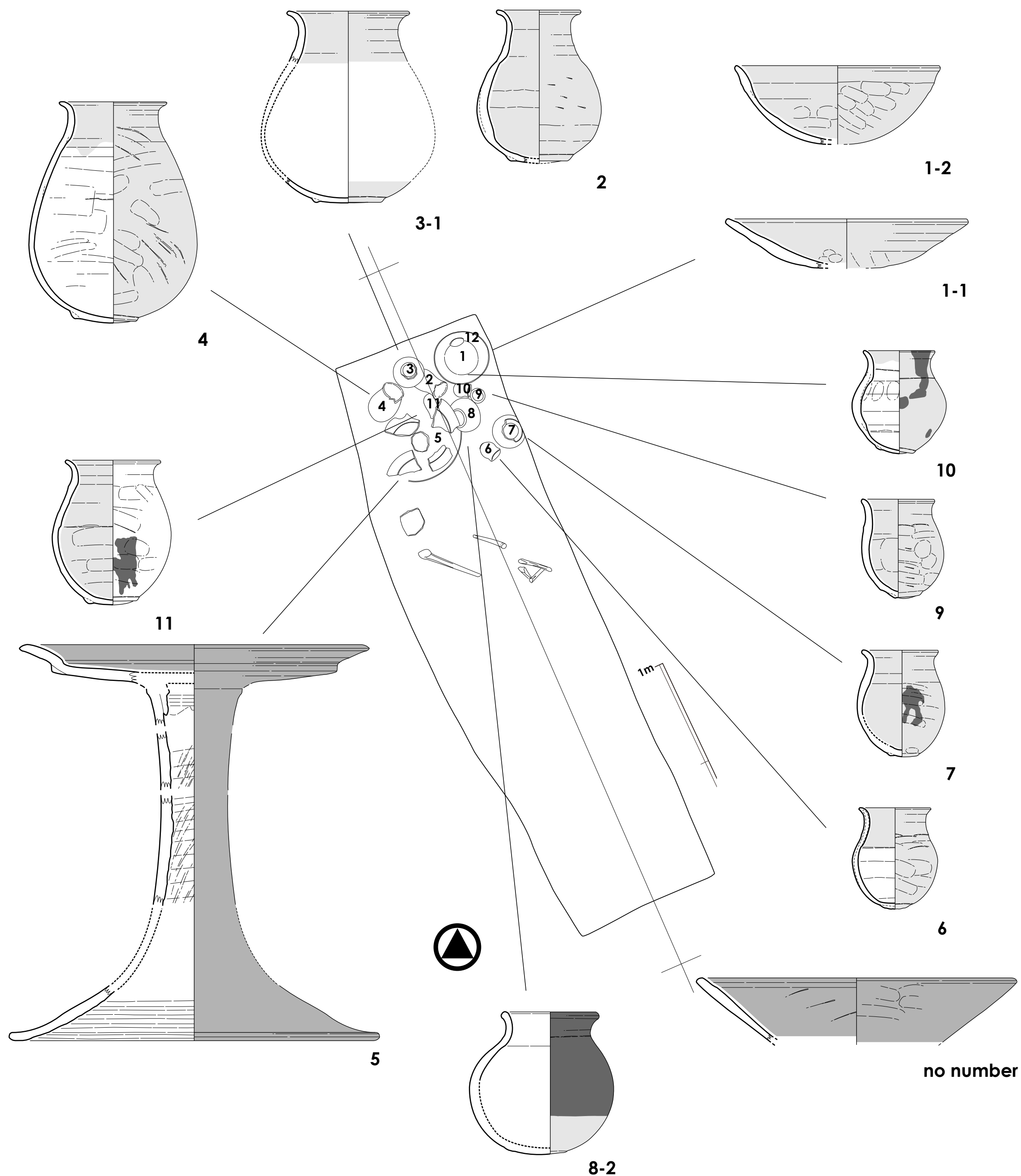


Figure 8.18 Plan of Burial no.56 (1:30)

The presence of a large pit lined with clay and numerous pots of the typical Harappan nature, along with a spoon made from a bi-valve shell all indicate the high socio-economic status of the person interred in this burial.

Burial No. 68 (Tr. CG1, CG2)

(Figures 8.23 - 8.27)

This burial is located 2.20 m to the west of the eastern section on the banks of trenches CF1 and CF2. The northern 70 cm of the burial pit falls in CF2, whereas the remaining southern part falls in CF1. This burial is located 80 cm below the present surface. It is a secondary burial belonging to the Early Mature Harappan Period (Burial Phase I). The burial is oriented 5° in the northwest to southeast direction. The burial pit is 2.80 m in length, and the width increases from 47 cm in the southern end to 72 cm towards the northern side. The burial pit is 60 cm deep, but human remains were placed at a depth



Figure 8.19 General view of Burial no.56, from southeast



Figure 8.20 Details of Burial no.56



Figure 8.21 Details of Burial no.56



Figure 8.22 Details of Burial no.56

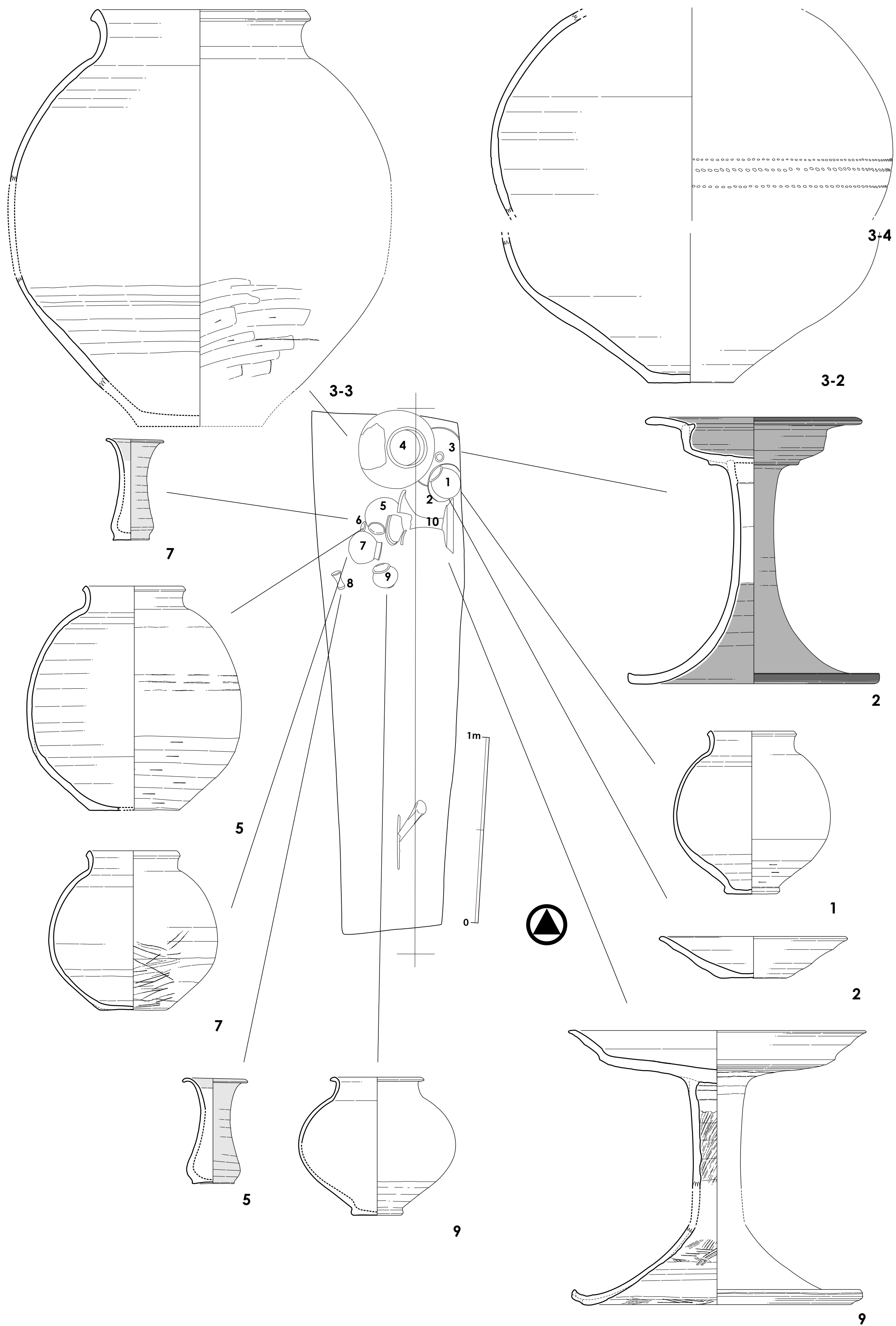


Figure 8.23 Plan of Burial no.68 (1:30)



Figure 8.24 General view of Burial no.68, from east



Figure 8.25 Details of Burial no.68



Figure 8.26 Details of Burial no.68



Figure 8.27 Details of Burial no.68

of 25 cm. Only two fragments of two bones have survived. These include a fragmentary left tibia and fibula. These remains are located 35 cm to the north of the southern line and 10 cm to the west of the eastern line. The part of fibula is oriented in the north to south direction. The pit contained a long, truncated cylindrical bead 10 cm to the north of the fibula. The pots were found at a depth of 50 cm.

Towards the northern end of the burial pit were found 8 pots over an area of 90 cm from north to south and 65 cm from east to west. They are placed haphazardly. Pot No. 1 is a globular Kot Diji type pot with a perfectly round body and everted rim. It probably has a flat, narrow base, 70 cm in height with a mouth diameter of 10 cm. It has fallen to the northwest side. Pot No. 2, which is to the north of Pot No. 1, is a tall bowl-on-stand belonging to the Early Mature Harappan Period. It is broken at the middle of the stem and the upper part has fallen towards the southeast side. Pot No. 1 was found inside the bowl portion of bowl-on-stand. It has a long, slender stem and flared stem, the diameter of which is 26 cm. The bowl on top has a small mouth deep in the centre and a funnel rim. Its diameter is 20 cm. The lower portion of the bowl-on-stand was vertical in situ. To the west is Pot No. 3, which is a large globular vessel with a flat, narrow base. It has a short vertical neck and triangular rim. The mouth;s diameter is 22 cm. The height of the pot is 42 cm. It was found tilting slightly to the east. Pot No. 4 is the same as Pot No. 1 but bigger in size. It lies to the west of Pot No. 3 and has tilted slightly towards the southwest. It has a mouth diameter of 10 cm and a height of 23 cm. The eastern part of this pot is hidden by the base of Pot No. 9, which is a dish-on-stand. Pot No. 5, to the south of Pot No. 4, appears to be a funnel mouth from a Harappan beaker. It has fallen to the west and only the rim portion was exposed. Its body was hidden under Pot No. 4 and Pot No. 6. The diameter of the pot's mouth is 7 cm. Pot No. 6, which is south of Pot No. 5, is a classical Kot Diji pot with perfectly round body, flat tapering base, short vertical neck, and rounded featureless rim. It is 18 cm in height and the mouth has a diameter of 9.5 cm. Pot No. 7 is a funnel-mouthed small Harappan beaker with slightly concave body that bulges toward the lower portion and has a dish base. It is 11 cm in length and the mouth's diameter is 6.5 cm. It was found 10 cm to the southwest of Pot No. 6. To the east at a distance of 12 cm is a globular pot (Pot No. 8) with concave neck and everted out turned rim. It has a concave bulging body, tapering towards its narrow disc base. It is 15 cm in length with a mouth diameter of 10 cm. It has tilted to the northwest. Pot No. 9 is to the east of Pot No. 4. It is a dish-on-stand with a long hollow stem (17 cm), flared base and raised and internally cut edge. The height of the stand from the base of the dish is 24 cm. The dish on top, which faces the eastern section of the pit, is large with a flat base and sharp raised upper edge. The diameter of the dish is 32 cm. It has fallen to the east. Out of the total number of pots, Nos. 2, 5, 6 and 7 are of the chocolate slipped variety and the rest are of the Harappan Red variety. The presence of long stemmed dish-on-stands and bowl-on-stands and chocolate slipped pots indicate that this burial belongs to the Early Mature Harappan Period of the cemetery. This is one of the richest burials of the Early Mature Harappan Period and probably belonged to a very influential person in the family.

4 BURIALS OF PERIOD-IIB

In all, 17 burials belonging to this period have been excavated. Nine are primary, four are symbolic, and four are secondary. The majority of these burials are oriented in the northwest to southeast direction (9), while 7 are oriented from north to south, and 1 is oriented from northeast to southwest. Burial Nos. 49 (Primary) and 58 (secondary) are lined with a clay coffin.

Symbolic Burials

Burial No. 12 (Tr. CD3)

(Figures 8.28 - 8.31)

This burial is oriented 15°, or from the northwest to southeast. It is located along the southern margin of the trench at a distance of 2.30 m to the west of the eastern trench line. This is a symbolic burial as the burial pit lacks skeletal remains. The rectangular burial pit is 2.10 m long and the width varies from 45 cm towards the southern end to 60 cm in the middle. Towards the northern end it is 52 cm broad. The pit has survived to a depth of 36 cm. In the northern end were found 5 different pots, which were included as burial goods. All the pots are of a fine red variety. Pot No. 1, which is at the northern end of the pit, is a large globular pot with a short out-turned beaded rim. Around the neck is a broad groove. The diameter of the rim is 22 cm. As a major portion of the pot remains underground, its exact circumference cannot be measured. The remaining four pots are to the south of Pot No. 1 in a line running east to west. Pot No. 2, which is at the western end of the line, is a medium sized spherical pot with a short out-turned rim. The pot is 18 cm high with a diameter of 10 cm. Pot No. 3, immediately to the east of Pot No. 2, is more or less similar to Pot No. 2, except that its body is globular. The diameter of its mouth and along with its overall height is similar to Pot No. Pot No. 4 is a dish with a slightly flared rim and concave profile. It has a diameter of 25 cm. Half of the rim is missing. At the eastern end of the line is a large goblet with a flat disc base. The details of the pot are not visible as the upper half of the pot of missing. This burial, which is quite deep, belongs to Burial Phase II, which is associated with the Middle Mature Harappan Period.

After documenting the burials in situ, it was decided to remove the pots from their burials for further studies. At the base of the large globular pots were found more pots and on further excavation in the lower level of the pit, 19 other pots were discovered.

These pots were found spread haphazardly over an area of 80 cm from north to south an 50 cm from east to west. They were found at a depth of 50 cm. Pot No. 6 in the northern section, which had fallen to the east, is at the extreme eastern end of the pots. It is a small bowl with a squat bulging body, possibly flat surface, narrow neck and short vertical, featureless rim. It is 8 cm in height with a rim diameter of 7 cm. To its southwest is Pot No. 7, which has been broken into pieces. It appears to be a small basin with a rounded base. Inside is Pot No. 8, which is a shallow convex-sided bowl with slightly flaring sides and a featureless but sharp rim. It has twisted to the west within Pot No. 7. The diameter of this pot is 22 cm. Pot No. 9 is a small beaker that tapers towards its base. It has a flat base with a slightly flared featureless rim. It is north of Pot No. 11. It has fallen horizontally toward the NW. It is a miniature beaker measuring 5.5 cm in length and its mouth has a diamter of 5.5 cm. Pot No. 10, which has broken into many pieces, is to the west of Pot No. 8 and below Pot No. 11. It is a globular pot with a prominent everted rim. It probably has a flat narrow base. Though it has broken into pieces, it still stands vertical. On top of Pot No. 10 is Pot No. 11, which is a globular pot with a ring base. It has fallen to the west. It is 16 cm in height and its mouth's diameter is 10 cm. This is a well preserved pot. Pot No. 12, which is to the west of Pot No. 11, is a typical Harappan beaker with an elongated body, slightly broad base, narrow and flat bottom, and a prominent everted rim. It has fallen flat to the east. It is 11 cm in height and as part of its rim is hidden below Pot No. 11, its diameter cannot be measured. Pot No. 13, which appears to be of medium size, is a globular pot with sloping shoulders and an everted rim. It lies below Pot Nos. 11 and 12. This pot is broken into fragments, some of which stand vertical and some of which are flat on ground. At a distance of 14 cm to the south is Pot No. 14, which is a miniature lid. It is a dome shaped lid with incurved mouth portion and a 3 cm tall narrow knob. It was found lying flat on the

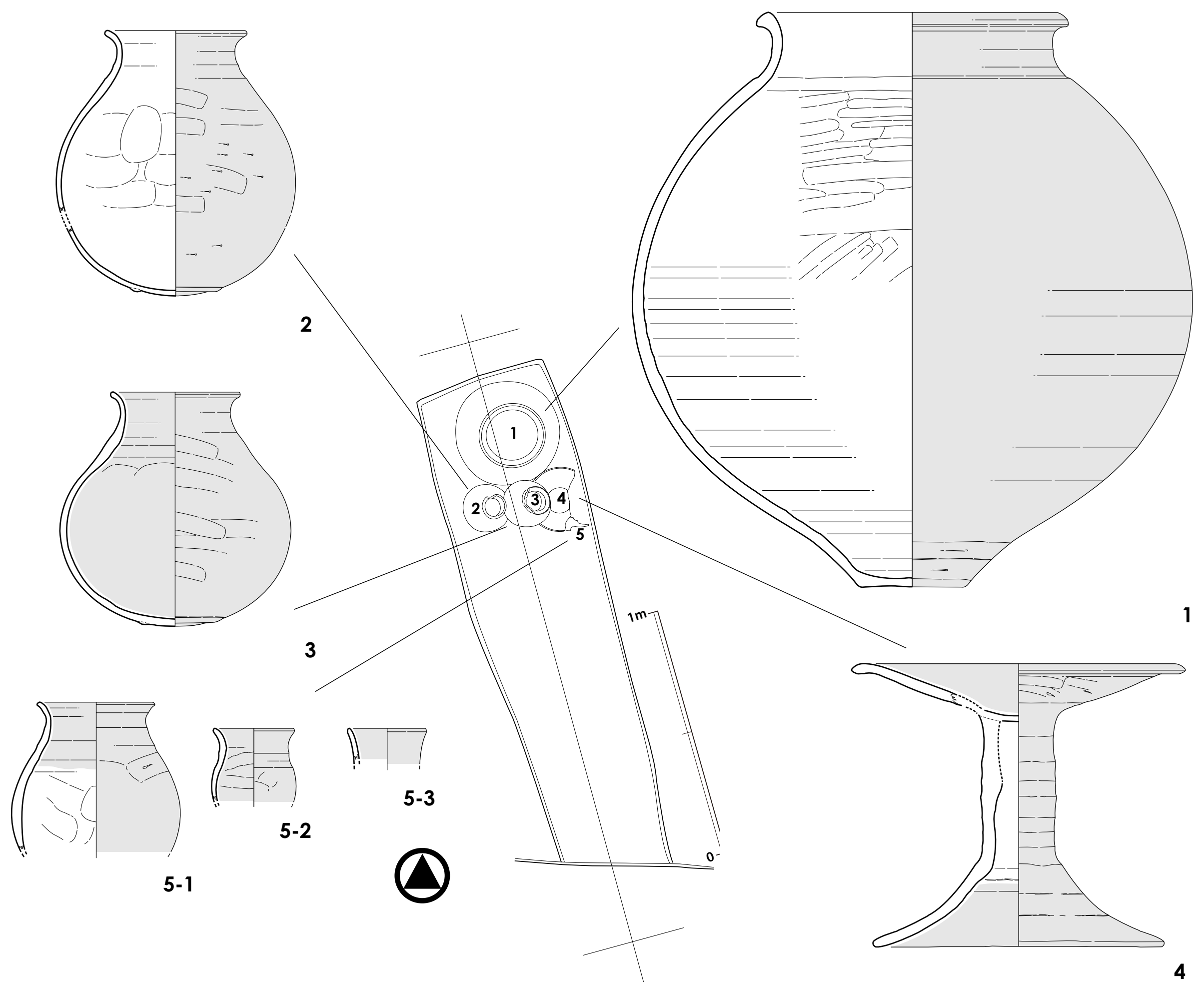


Figure 8.28 Plan of Burial no.12 (1:30)

ground. To the east of Pot Nos. 14 and 16 lies Pot No. 15, which is a large coconut shaped pot with narrow neck, internally and externally projecting rim, and a groove on top. It stands vertical but because of the pressure of the large globular pot that was placed on its top, the western part of its body has been smashed. It may have had a ring base. To its west is Pot No. 16, which is a bowl-on-stand that has fallen to the south. It has a short, slightly flaring base with a roundish featureless edge. The diameter of the base is 13 cm. On top is a large bow, a squat, bulging body concave neck and flat internally and externally projecting rim with a shallow groove on top. The height of the bowl is 8.5 cm and the diameter of its mouth is 15 cm. To its west is a fragment of a bowl similar to Pot No. 8. It has inclined towards the west. It was assigned Pot No. 17. Pot No. 18 is a long, barrel shaped beaker with a flat base. The diameter of the base is 5 cm. It is 15 cm in length and its mouth has a diameter of 5 cm. It has fallen to the west. To its north is a fragment of a slightly deep saucer with a featureless rim. It lies flat on the ground facing upward. Pot No. 20 is a complete miniature beaker with an elongated body, flat base, slightly flared mouth and a featureless rim. It is 8.5 cm in height and its mouth diameter is 5 cm. It has fallen flat toward the southwest. It is to the east of the bowl portion of the bowl-on-stand (Pot No. 16). Pot No. 21 is also a beaker with a bulging base, flat bottom, and vertical but slightly flaring upwards body. The rim is featureless. It is 9 cm in height but as the rim is broken its dimensions cannot be measured. It lies between Pot Nos. 15 and 23. It has fallen to the east. To its east is another beaker, which has slightly bulging body and flat base. The upper half is broken. It stands perfectly vertical. To the south of Pot No. 21 is a perfectly globular pot (Pot No. 22) with bottle-

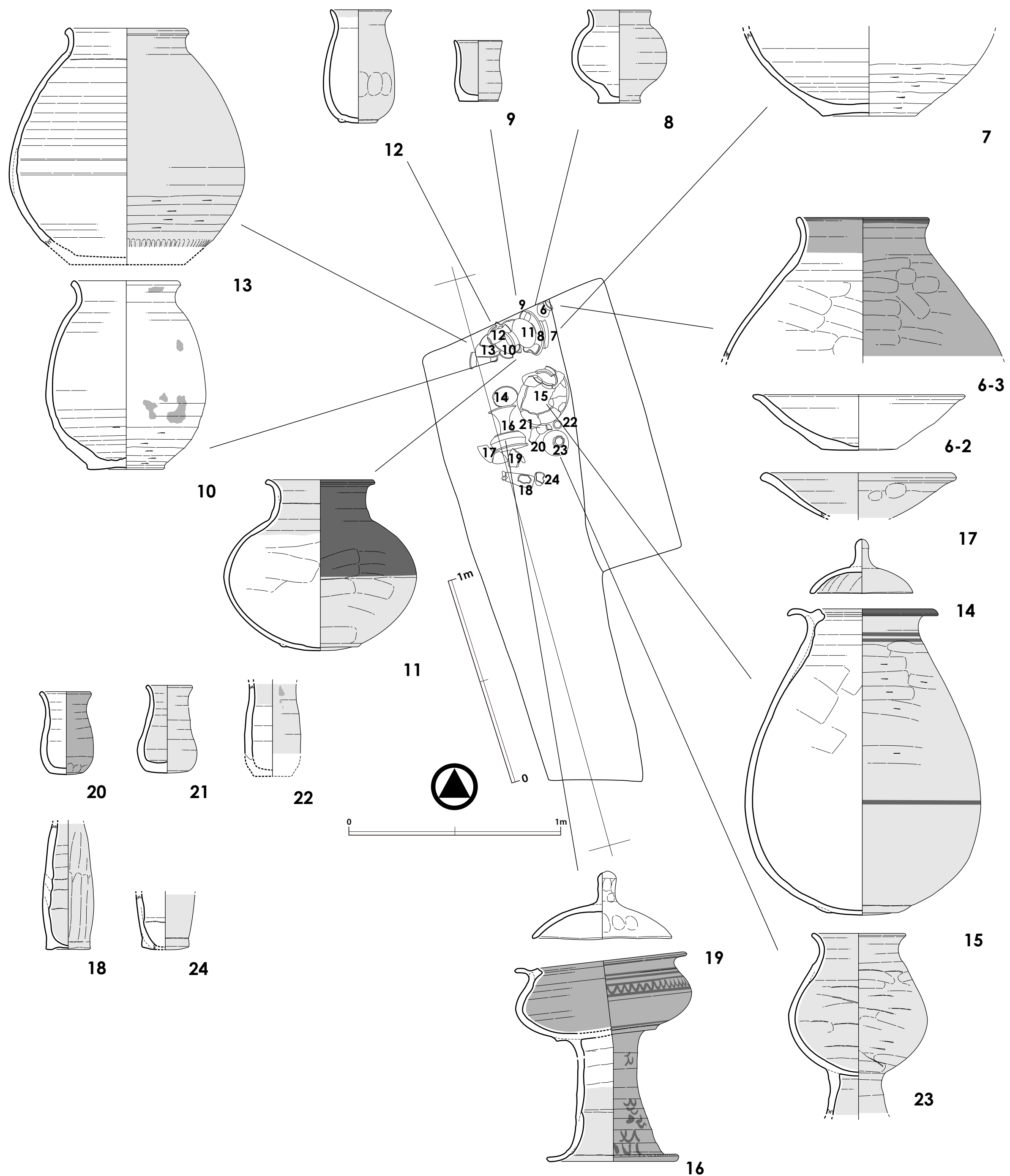


Figure 8.29 Plan of Burial no.12 (1:30)

neck. The rim portion is broken. It has a disc base. It is 17 cm in height and stands vertical. To the east of Pot No. 18 is one more beaker survived only by its base. As most of the beaker was not found, a detailed description is not possible. It is tilted towards the north. This burial, which is symbolic, has the highest number of pots so far excavated at Harappan Cemetery at Farmana. All the pots belong to classical Harappan types. Their number and quality suggest that the individual associated with this burial had a very high socio-economic status.

Burial No. 29 (Tr. CG3)

(Figures 8.32 - 8.33)

This burial is located along the western section of Trench CG3, 50 cm to the east of the western margin and 1.90 m to the south of its northeast peg. This burial belongs to Burial Phase II of the Middle



Figure 8.30 General view of Burial no.12, from east



Figure 8.31 Details of Burial no.12

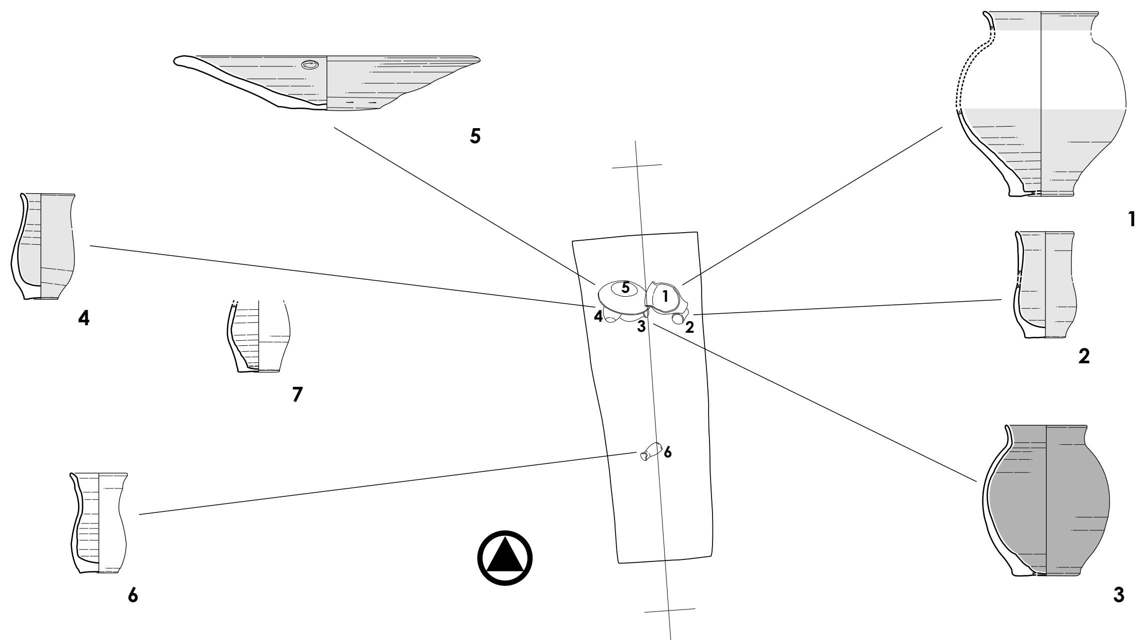


Figure 8.32 Plan of Burial no.29 (1:30)



Figure 8.33 Burial no.29

Mature Harappan Period and is oriented 10°, or in the northwest to southeast direction. Its pit is 1.30 m long and its width varies from 36 cm towards the southern end to 52 cm towards its northern end. It is a wedge-shaped burial pit devoid of skeletal remains. This symbolic burial may have been associated with a child, as the burial pit size is similar to that of burials that contained the remains of children. It contained 6 pots as burial offerings.

Pot Nos. 1 through 5 were located towards the northern end of the pit, placed in a row running east to west. Pot No. 6 was found lying in the middle. It is 40 cm north of the southern end. Pot No. 1 on the eastern end of the row is a typical Harappan pear shaped goblet that has been destroyed by ploughing. It has fallen towards the west. The total length of the pot is 16.5 cm and the diameter of its mouth is 6 cm. It has a flat, narrow base and everted rim. To its south is s miniature beaker, which has inclined slightly towards the south. This beaker is almost cylindrical with a featureless, slightly everted rim. It is 9 cm in height and its mouth diameter is 5 cm. It probably has a small flat base. To the south of Pot No. 5 are two pots, Pot Nos. 3 and 4. Pot No. 3 is a classical Harappan goblet and Pot No. 4 is a miniature beaker. Pot No. 3 has a round body with a slightly tapering flat base and short everted rim. It is 12.5 cm in height and its mouth's diameter is 6 cm. It was found lying flat towards the western side. Pot No. 4, which is a miniature beaker, is immediately to west of Pot No. 3. It is vertical in its upper part and slightly bulging in its lower part with slightly flat base (diameter 3 cm). It has a small everted rim. It is 8 cm in height and since it has fallen upside down, the diameter of its mouth cannot be measured. Pot No. 5, which is a lid of coarse variety, stood on its edge facing south. It has a small flat base with a concave surface. The diameter of its rim is 25 cm. Pot No. 6, located in the middle of the pit, is a miniature beaker resembling Pot No. 4 but slightly smaller in size. It is 8 cm in height and has a mouth diameter of 4 cm. It has fallen towards the west.

Considering the presence of five classical Harappan pots in this burial, the socio-economic status of the person appears to be high.

Burial No- 42 (Tr. CH4)

(Figures 8.34 - 8.35)

This burial is located along the eastern line of Trench CH4, 75 cm to the south of northern line. It is oriented 10°, or in the northwest to southeast direction. Its pit measures 97 cm in length and 40 cm in width. It has survived to a depth of 45 cm. The pit is lacks any kind of lining. This symbolic burial contains neither skeletal remains nor burial goods. As the burial does not contain pots, it is difficult to identify the burial phase or the cultural phase of this burial. This burial probably belonged to an infant whose social status was quite low.

Burial No. 44 (Tr. CG4)

(Figures 8.36 - 8.37)

This burial is located 1.60 m to the north of the southwest peg of trench CG4 along its western line. This burial is oriented in the north to south direction and belongs to Burial Phase II (Middle Mature Harappan Period). This pit is devoid of skeletal remains but has a few pots towards its northern end. It is another symbolic burial and lacks a clay lining. The pit is 1.60 m long and the width varies from 50 cm towards the southern end to 56 cm towards the northern end. It has survived to a depth of 7 cm.

Towards the northern end of the pit, three pots were found. Pot No. 1, which is broken, appears to be a typical Harappan goblet with a short everted rim and a possible flat base. To its west is a typical Harappan beaker which has fallen flat to the west. It has a slightly 'S' shaped profile, tapering flat base, and wide slightly flared mouth. It is 10 cm in height. The diameter of its rim cannot be measured, as it is broken. Pot No. 3, which is located to the south of Pot No. 1, is a small pear shaped Harappan goblet. It is also damaged, hence its dimensions cannot be

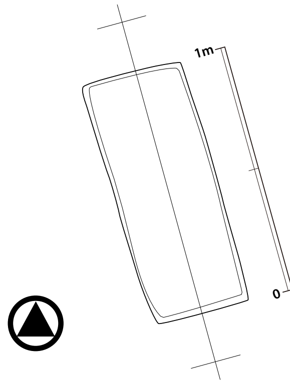


Figure 8.34 Plan of Burial no.42 (1:30)



Figure 8.35 General view of Burial no.42, from west

measured. It has fallen towards the south.

All three pots posses classical Harappan shapes that date the burial to the Middle Mature Harappan Period. Considering the small numbers of pots and pit devoid of clay lining, the socio-economic status of the person associated with this period appears to be have been somewhat low.

Primary Burials

Burial No. 1 (Trench 1)

(Figures 8.38 - 8.42)

This was the first burial excavated at the site. It lies 4 m to the east of western section of Trench 1 and 85 cm to the south of its northern section. Its burial pit was oriented in the north-south direction, and measures 2.40 m long. Its width varies from one end to the other. It is 87 cm towards the north and 60 cm towards the south, whereas in the middle it is 73 cm. As the upper portions of the burial pit were sliced during the removal of soil by a tractor, parts of the pit, burial pots and the skull of the skeleton were badly damaged. The depth of the surviving burial pit survived is 15 cm. The body lies in the north-south direction with its head towards the north and legs to the south. It was placed in a supine position facing upwards and straight. Both legs are straight, whereas the hands are placed on its lower abdomen in a crossed position. The total length of the skeleton is 1.50

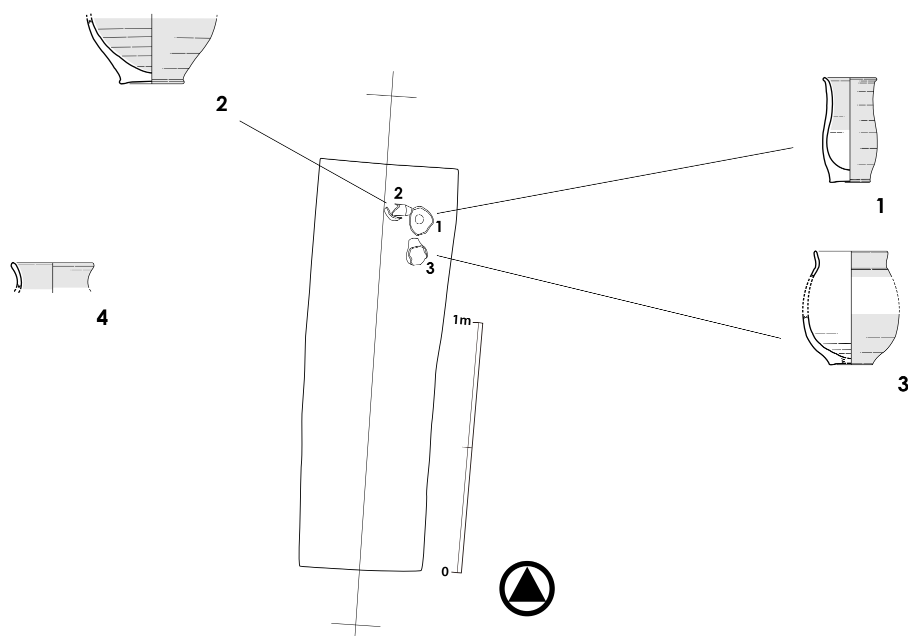


Figure 8.36 Plan of Burial no.44 (1:30)



Figure 8.37 General view of Burial no.44, from south

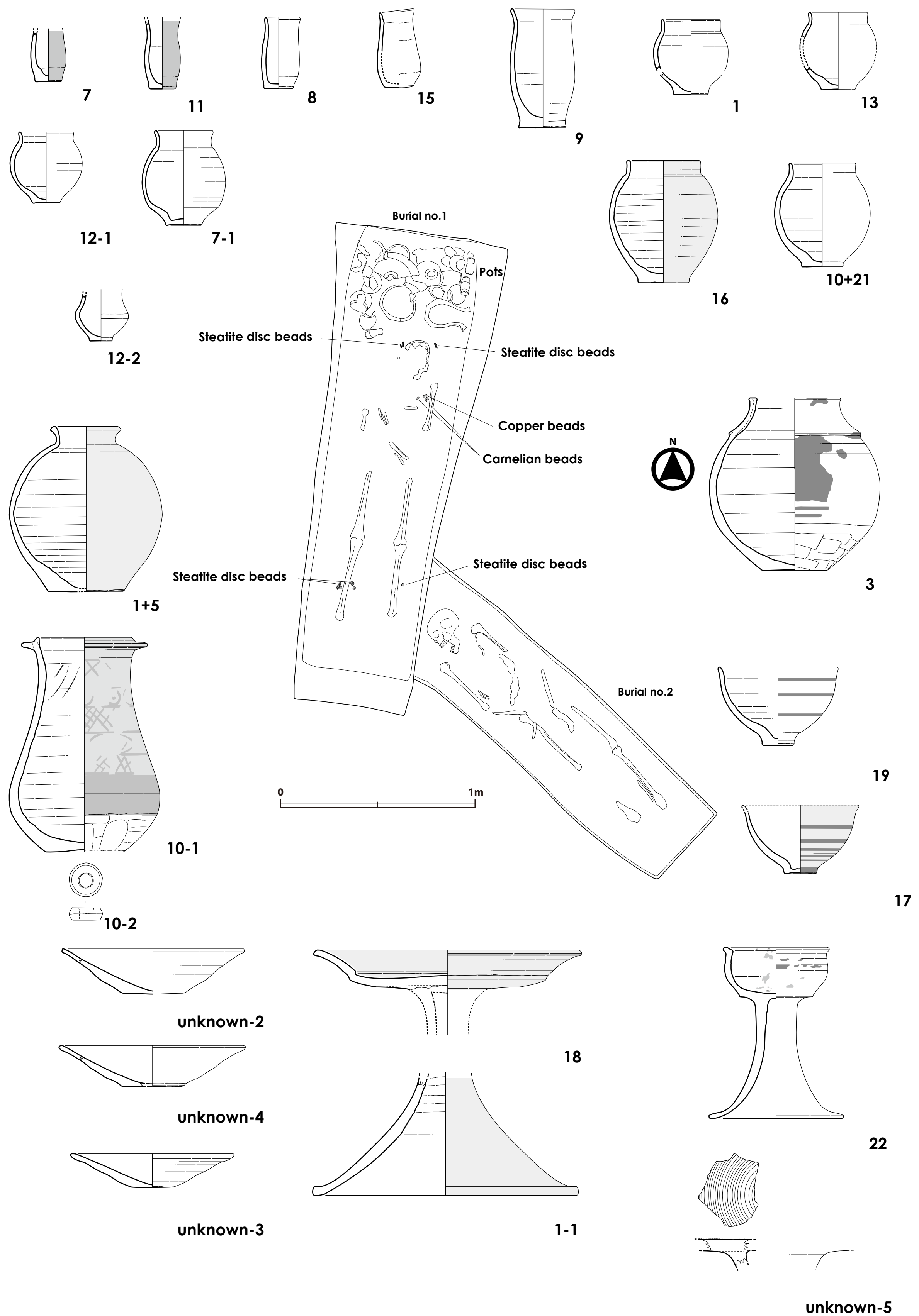


Figure 8.38 Plan of Burial nos.1 and 2 (1:30)



Figure 8.39 Burial nos.1 and 2 (1:30)



Figure 8.40 Burial pots of no.1



Figure 8.41 Beads from Burial no. 1

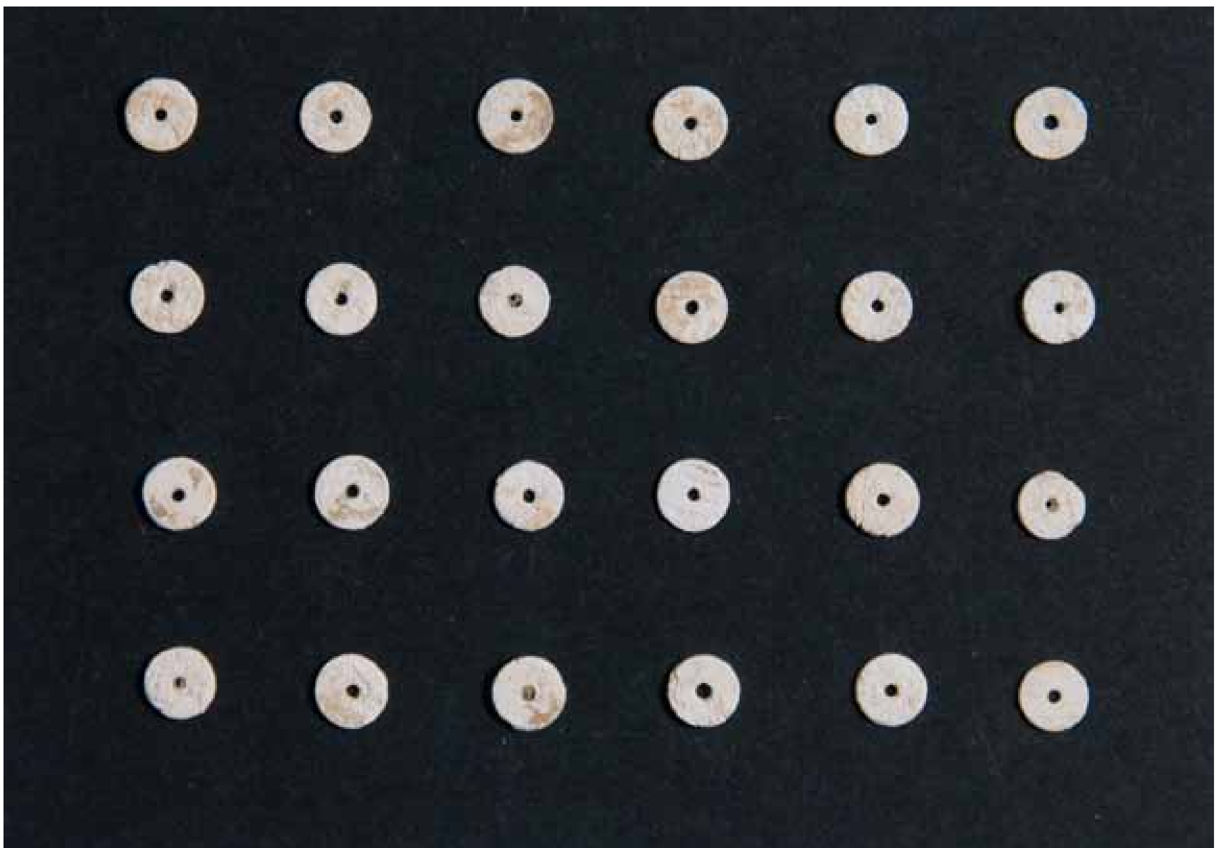


Figure 8.42 Beads from Burial no. 1

m. The length of its legs is 80 cm. The neck portion, ribs and parts of its right hand are damaged.

The deceased was buried with two necklaces, one made of globular copper beads, the other of barrel-shaped carnelian beads, which are visible near its left shoulder bone. Remains from numerous steatite disk beads are found on the left and right side of its skull. It is quite likely that they are part of a forehead band. The person was probably also buried with anklets made of steatite beads, the remains of which were found near both the left and the right ankles.

This burial contains numerous pots immediately to the north of the head. In all, 25 pots were interred, including one dish-on-stand, one small S-shaped jar, one bowl-on-stand, three dishes, and five beakers of different sizes. The rest are globular pots of small to medium size with flat bases. The condition of the skull and legs is good but the ribs, hand-bones and vertebrae are brittle. The skeleton probably belongs to a teenager. The rich burial goods from this burial indicate that the individual may have been a person of higher social class in society.

Burial No. 2

(Figure 8.38)

Burial No. 2 is another primary burial, oriented 30° from northwest to southeast. This burial predates Burial No. 1, as Burial No. 1's pit cuts the pit of Burial No. 2 towards its northern end. The skeletal remains in this burial are the best preserved amongst the excavated burials at Farmana, as it was located away from the ploughing zone. The dead body was placed in the north-south direction, with its head towards the north and legs towards the south. The rectangular burial pit is 1.94 m long and its width varies from 60 cm towards its northern end to 48 cm towards its southern end (see Figure 58 and 59). At present the burial pit appears devoid of any burial goods, but it is quite likely that some pots were placed at the northern end of the pits, which may have been removed when the later burial pit (Burial No. 1) was cut. This surmise is based on the fact that in all the burials save for the symbolic one, burial pots were found placed at the northern end.

The dead body inside the pit was placed in an extended and supine posture. The head of the person is tilted towards the south. The legs are straight and the lower arms are crossed over the lower abdomen. The total length of the skeleton is 1.59 m. This skeleton appears to belong to a fully-grown adult as it has almost all its teeth and robust bones. It was placed in the pit with its head towards the north and legs towards the south. The rectangular burial pit is 1.94 m long and its width varies from 60 cm towards the northern end to 48 cm towards the southern end

Burial No. 14 (Tr. CE3)

(Figures 8.43 - 8.47)

This is one of the best preserved primary burials at the site, located 2.50 m north of the southern trench line and 2.60 m to west of the eastern line. The burial is oriented 200, or in the northwest to southeast direction, and belongs to the Middle Mature Harappan Period or Burial Phase II. The burial pit is 2.80 m long with an average width of 70 cm. It has survived to the depth of 45 cm. The skeletal remains found at the base of the pit are so well preserved that even patellae, metatarsals and phalanges have survived. The body was placed in an extended supine position with hands and legs straight. The head of the body faces east. Based on the skull and long bones, the body appears to have belonged to a strong, well-built adult male. The total length of the skeleton is 1.75 m. Its toes were positioned so that they point towards the south whereas the palms were laid flat against on the hips. All the long bones, vertebrae, ribs, pelvic bones, shoulders, neck, mandible skull are well preserved.

The burial is devoid of pots but probably included a necklace of banded agate beads, one of which is visible near the deceased's left clavicle. Between its legs, near its knee were placed two polished bone tools. The presence of the bone points as burial offerings leads to hypothesis that the deceased may have been a hunter in life. This may explain the

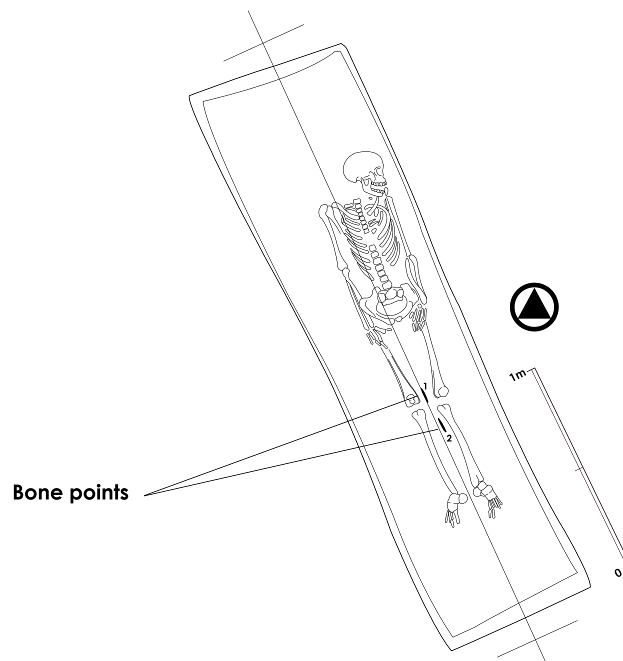


Figure 8.43 Plan of Burial no.14 (1:30)

absence of pottery in the burial pit.

Burial No. 21 (Tr. CF3)

(Figures 8.48 - 8.49)

This burial is located very close to the to the southeast of Burial No. 20. In fact it has been partially damaged by Burial No. 20, which must have been interred slightly later. The burial is located 12 cm to the west of the eastern line of Trench CF3 and 1.90 m to the north of the southern trench line. It is oriented 450 in the NW-SE direction. It belongs to Burial Phase II or the Middle Mature Harappan Period. The burial pit has survived to a maximum length of 1.55 m. The northern portion has been cut off by the burial pit of Burial No. 20 and therefore the original length of the pit cannot be measured. The pit is 56 cm broad and has survived to a depth of 32 cm.

The body has been destroyed from the hip upward due to the cutting of Burial No. 20. The lower skeleton, particularly the left radius and ulna, carpals metacarpals, phalanges, right radius and both legs have survived in a good state. The hands and legs are straight; however both the feet have been turned towards the east. The left hand, which has partially survived, is straight and placed flat on the left femur. As the portion above the hip is either cut or beneath burial no. 20, the area of the pit that may have contained burial offerings has not been recovered. This is a burial belonged to a fully-grown adult who, on the basis of skeletal evidence, was robust and strong. As the burial goods are missing the status of the individual cannot be determined.

Burial No. 23 (Trs. CF2 and CF3)

(Figures 8.50 - 8.56)

Beneath a is Burial No. 23, which belongs to Burial Phase II of the Middle Mature Harappan Period. It is a primary burial, oriented in the north to south direction. The dead body positioned placed with its head towards the north and legs towards the south. The head is tilted west. The total length of the person is 1.34 m. Only its head, lower jaw, parts of its lower extremities, and parts of its right hand were visible. The remaining portion of the body is hidden beneath the leg bones of Burial No. 22. The head of the person looks roundish with a strong lower jaw. The legs of the person also appear sturdy. The total length of the burial pit is 2 m and its average width is



Figure 8.44 General view of Burial no.14, from south



Figure 8.45 Details of Burial no.14



Figure 8.46 Details of Burial no.14



Figure 8.47 Details of Burial no.14

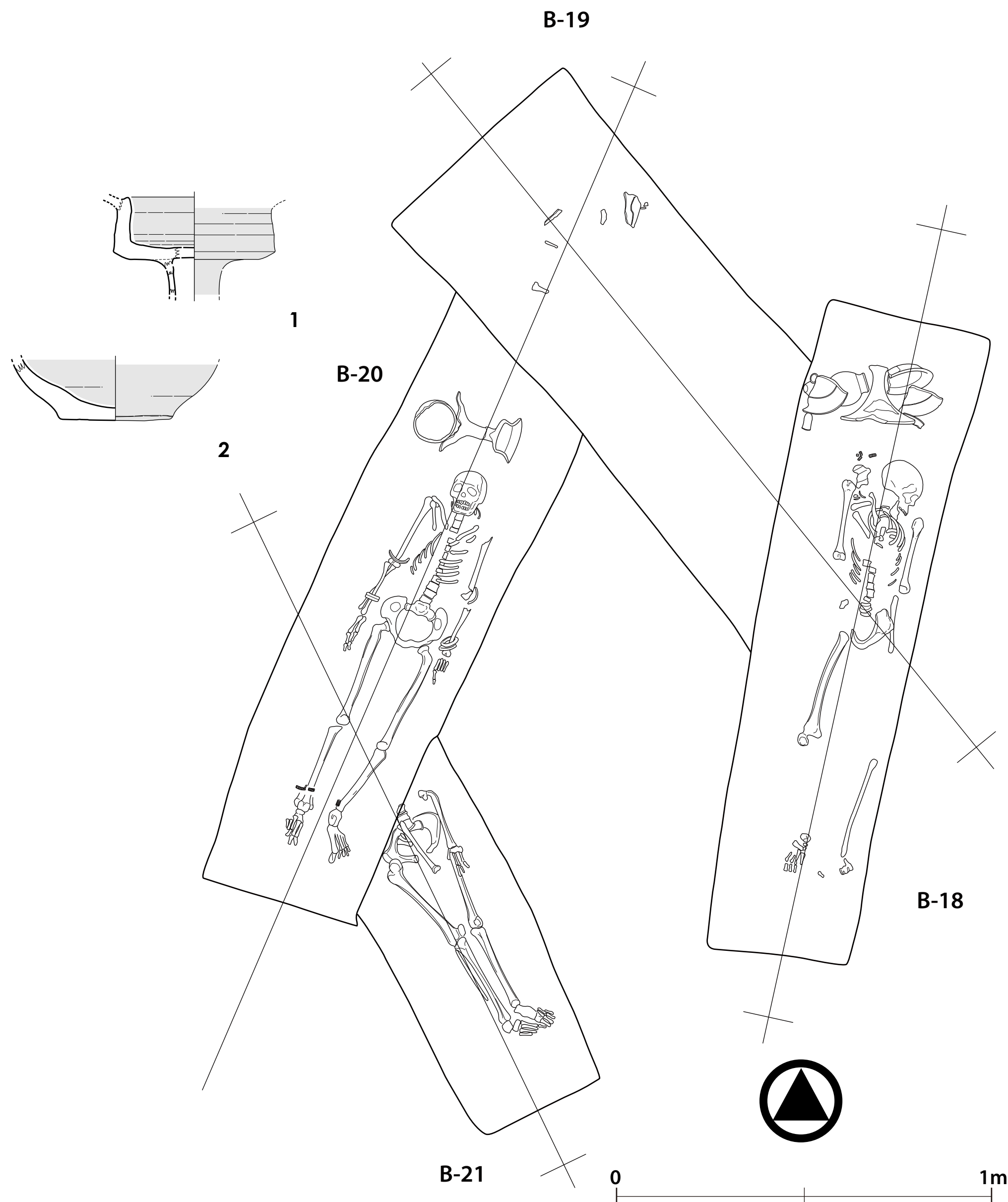


Figure 8.48 Plan of Burial nos.18, 19, 20 and 21 (1:30)

55 cm. It has survived to a maximum depth of 35 cm. However the skeletal remains were found at a depth of 25 cm. Along its northern end, a portion of the pit extends 10 cm below the rest of the pit, presumably to provide a place for burial goods.

The burial contained 9 pots, 8 of which are almost complete. The ninth is framentary. All of the pots belong to the fine red variety except for Pot Nos. 1 and 3, which are local types. The other pots are classical Harappan goblets and beakers.

Burial No. 45 (Tr. CG4)
(Figures 8.57 - 8.60)

This burial is located 2.30 m to the south of northern section and 1.50 m to the west of the eastern section of the trench CG4. The burial is oriented 45°in the northwest to southeast direction and measures 1.92 m in length and 60 cm in width. Towards the southern end the pit is 75 cm deep whereas it is higher towards the northern side and 50 cm deep in the northern end.

The pit lacks a clay lining. This primary burial contained the complete skeleton of a man aged between 30 and 35. Since the pit is uneven, the upper part of the body has tilted towards the west whereas



Figure 49 Burial nos.18, 19, 20 and 21

portions of the legs below the knees are slope toward the base of the pit. The skeleton is 1.22 m long, and both the legs were placed parallel, pointing straight towards the south. The left hand also points south, flat along the body. The right hand is hidden below the trunk of the skeleton. All the bones of the skeleton are well preserved and in good state. The head of the person, located in the northern part of the pit, is tilted to the west. Its mandible and teeth are intact and in good condition.

This burial is devoid of any burial goods, including pottery. This leads the authors to believe that the status of the person was probably quite low. The other possibility was that this person, who was shorter than normal, may have been disrespected hence given a simple treatment after his death.

Burial No. 48 (Tr. CF4)
(Figures 8.61 - 8.67)

This burial is located 1.70 m to the south of the northern section of Trench CF4 and 93 cm to the east of Burial No. 47. This well-preserved primary burial belongs to the Middle Mature Harappan Period (Burial Phase II). Its burial pit is lacked a clay lining and was oriented 15° in the northwest to southeast direction. The pit is 2.63 m long, 60 cm wide, and has survived to a maximum depth of 85 cm. The depth of the pit protected the bones from damage from human activity. The body found inside the pit is well preserved but the bones above the hip have been misplaced. Though the head is missing, the bones below the hip are well preserved. It appears that the upper part of the body was raised on a platform in a sloping position whereas the lower portion of the body was placed flat on the ground in an extended position. The legs were placed close to each other, horizontal towards the south. Both the hands were placed parallel to the body and the phalanges were found in a straight north to south line

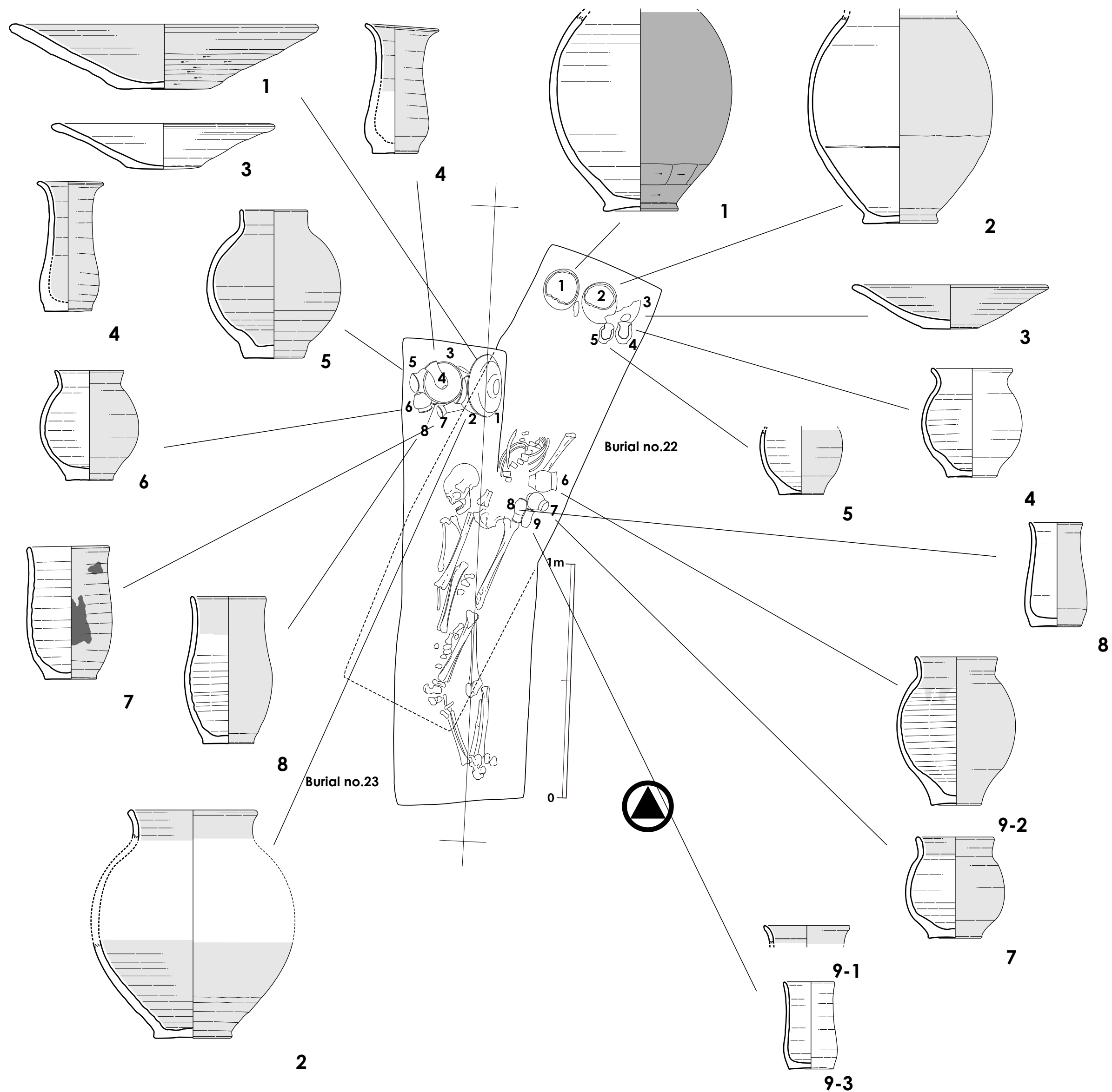


Figure 8.50 Plan of Burial nos.22 and 23 (1:30)

next to the upper parts of femurs. The pelvic bone, and lower vertebrae, and a few ribs are in a good state of preservation. Because the upper part of body was placed on a sloping platform, all the upper bones have been disturbed and scattered. It is also likely that they were disturbed by the rodents as the numerous rodent holes found inside indicate would indicate. The total length of the body starting from the position of its clavicle bones is 1.60 m. It thus appears that the person was close to 6 feet in height.

To the northern end of the pit were found 10 pots of different sizes and shapes. These were placed close to each other as burial offerings, and have not been disturbed as they were found standing in their original vertical positions. They were placed over an area of 50 cm from north to south and 60 cm from east to west. The large dish-on-stand numbered Pot No. 1 was found towards eastern side of the burial pit was found standing vertically. The southern half of the upper dish is broken. It is a typical step-sided dish from the Mature Harappan Period, with incised concentric circles in the centre. The dish has a diameter of 36 cm. The slender stem of the dish-on-stand flares towards the base, but as its lower portion is still hidden, its exact shape and dimensions cannot be identified. To its northwest is Pot No. 2, which is globular in shape with carinated neck and a short out-turned rim. Its mouth's diameter is 12 cm, and as its lower portion is



Figure 8.51 General view of Burial nos.22 and 23, from south



Figure 8.52 General view of Burial nos.22 and 23, from east

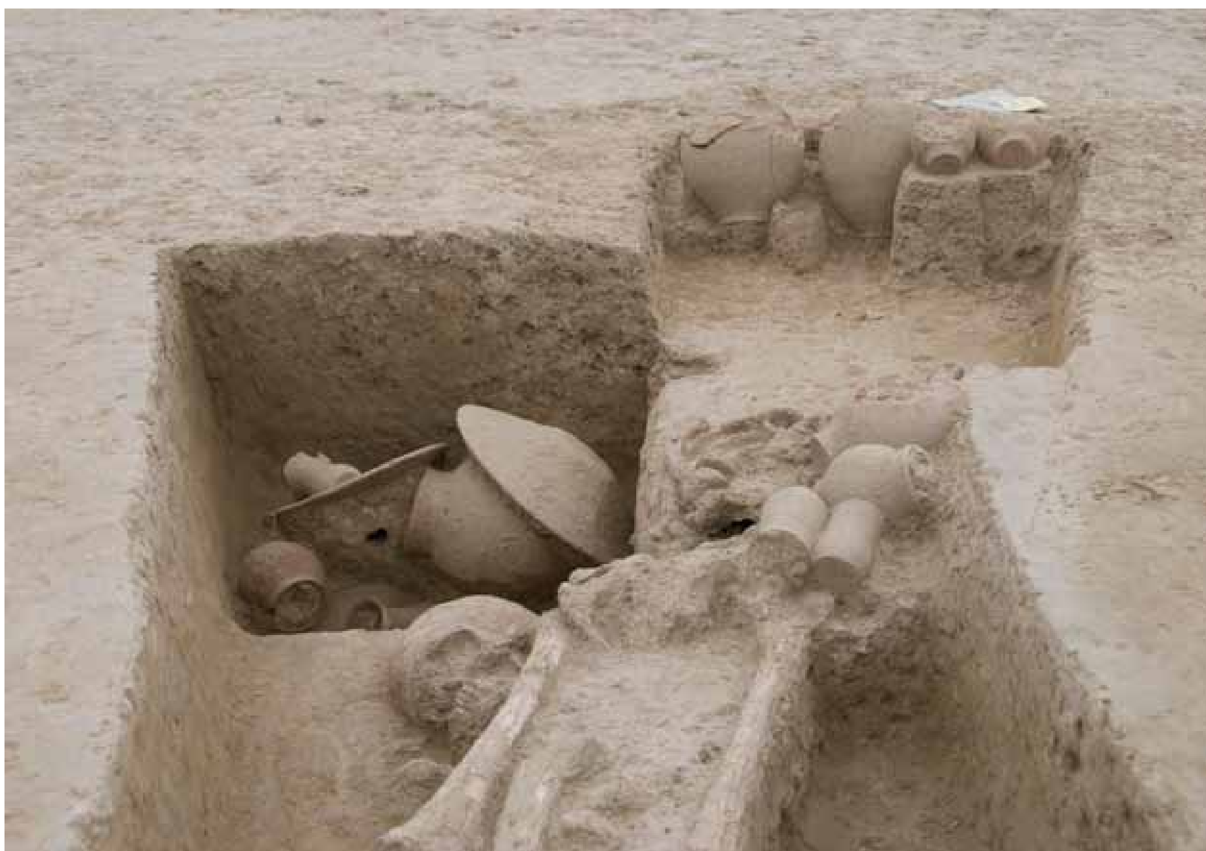


Figure 8.53 Details of Burial nos.22 and 23



Figure 8.54 Details of Burial no.22



Figure 8.55 Details of Burial no.23



Figure 8.56 Details of Burial no.22

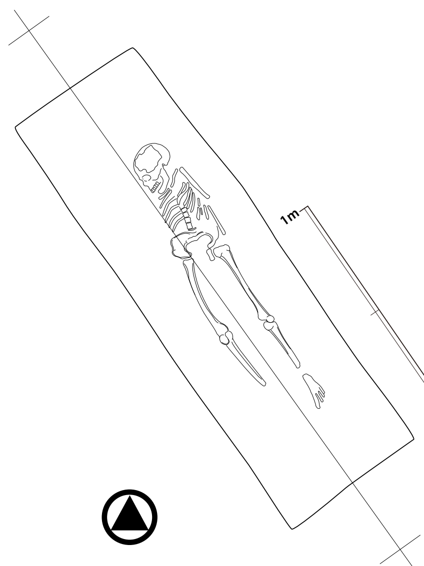


Figure 8.57 Plan of Burial no.45 (1:30)



Figure 8.58 General view of Burial no.45, from southeast



Figure 8.59 Details of Burial no.45



Figure 8.60 Details of Burial no.45

still embedded in the ground, the exact shape of its base as well as its height cannot be recorded. To the northwest of Pot No. 2 is Pot No. 3, which is a lid that has fallen at its edge towards the north. It is dome-shaped with a diameter of 23 cm. This lid was probably used to cover Pot No. 4, which is located to the south. Pot No. 4 is a medium-sized, perfectly globular pot with concave neck and short out turned rim. It has a small round mouth with a diameter of 11 cm. As the lower portion has not been exposed, the neither the shape of its base or its height can be determined. This pot turned slightly towards the west. Pot No. 5 is a miniature lota with short slightly bulging body, wide mouth and with prominent everted rim. Its mouth's diameter is 6 cm. It is located to the southwest of Pot No. 6. Pot Nos. 6 and 7 are almost identical to Pot No. 5 in terms of shape and size. All 3 pots – Pot Nos. 5, 6 and 7, were found standing perfectly vertical. Pot No. 8 is also similar to Pot Nos. 5, 6, and 7 but slightly bigger in size. Its mouth's diameter is 8.5 cm. The height of these pots (Pot Nos. 5, 6, 7 and 8) cannot be measured and the shapes of their bases cannot be identified as they are embedded in the floor of the pit. Pot No. 9, which is to the south of Pot No. 10, is a small globular pot with a round body, concave neck and prominent everted rim. It has wide mouth with diameter of 10 cm. This pot is tilted towards the west and not yet fully visible. Pot No. 10 is similar to Pot No. 2, but slightly bigger in size. Its mouth's diameter is 12 cm. It is 17 cm in height and slightly tilted towards the northeast.

This burial appears to belong to a well-to-do

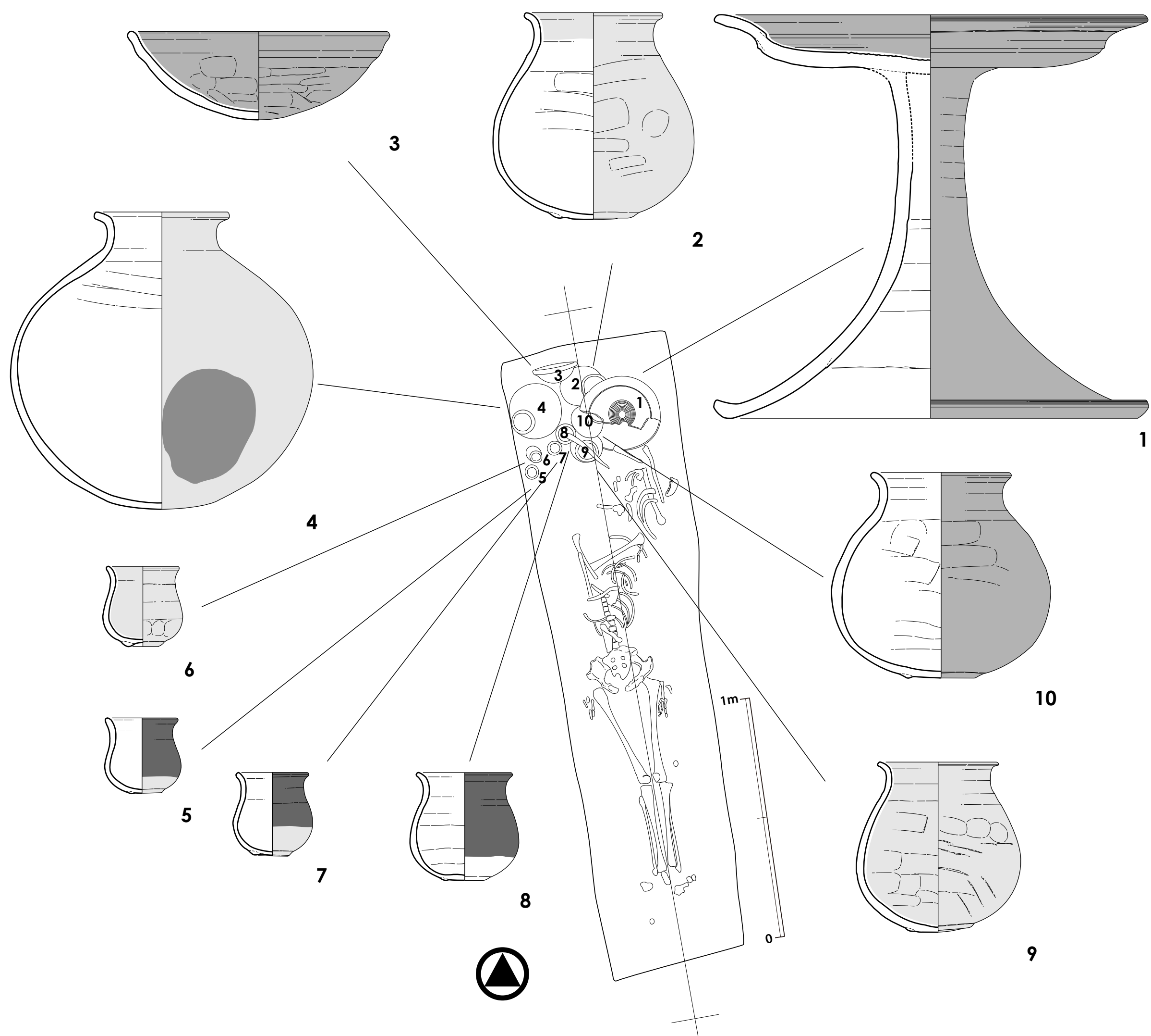


Figure 8.61 Plan of Burial no.48 (1:30)



Figure 8.62 Plan of Burial nos.47 and 48, from south



Figure 8.63 Details of Burial no.48



Figure 8.64 Details of Burial no.48



Figure 8.65 Details of Burial no.48



Figure 8.66 Details of Burial no.48



Figure 8.67 Details of Burial no.48

person whose standing in the society was high. This interpretation is based on the burial's large, deep and well-cut pit and on the number of pots interred with the decased.

Burial No. 49 (Tr. CF4)

(Figures 8.68 - 8.70)

This burial is located 1.20 m to the east of Burial No. 48 and 1.83 m to the south of the northern section of the trench. It oriented in the north to south direction. It was probably a primary burial, but has been extensively damaged by ploughing due to its proximity to the ploughing zone. The burial pit is 1.75 m long and the width varies from 47 cm in the southern end to 57 cm in the northern end. It has a 20 cm-thick clay lining on all sides. The pit has survived to a depth of 10 cm. Insidethe burial only parts of right tibia, left radius and ulna and a small portion of right humerus were found. The body's left hand was placed over the abdomen. A complete shell bangle was found in the left hand. Other burial goods may have been included, but they have completely vanished due to modern disturbance.

Towards the northern end of the pit were found 8 different pots, some of which are classical Harappan shapes and some of which belong to regional Harappan varieties, arranged in an east-west row. Ploughing has also destroyed some of the pots. Pot No. 1 is a lid that resembles a deep saucer with a slightly pointed flat knob. It lays to the south east of the pottery row below Pot No. 2 and the lid has tilted to the north. This lid has been extensively damaged and its diameter and depth cannot be measured. Inside the lid was a small, pear shaped goblet that has fallen upside-down. To its northwest is Pot No. 4, which is also a typical Harappan pear-shaped goblet but larger in size. The pot has fallen towards the western side. To its northeast is another pear-shaped goblet, which has tilted towards the southwest. Its flat narrow base has a diameter of 4 cm. It is 9 cm in height with a mouth diameter of 6.5 cm. Pot No. 5, which is to the north of Pot No. 6, is a miniature Harappan beaker, a major portion of which is broken. It has fallen towards the east. Pot No. 6 appears to be another flat based, saucer shaped lid made of a local, slightly coarse fabric. It appears on top of Pot No. 3, which has slipped towards the north and now stands vertical on the edge. Pot No. 3 is also extensively damaged and measurement of its diameter is not possible. Pot No. 7, which is to the west of Pot No. 3 and south of Pot No. 6, is a small globular pot with short vertical neck and everted rim. Though its base is still embedded in the floor of the pit, it is probably flat. The pot has fallen, and its rim diameter is 8.5 cm. It has tilted to the west of Pot No. 8 to the east of Pot No. 7. It is represented only by a large potsherd, which appears to have belonged to a wide-mouthed convex-sided bowl. Pot Nos. 1,6, and 8 are made of slightly coarse clay and they appear to belong to a regional variety. Pot Nos. 2, 3, 4, 5 are classical Harappan shapes and Pot No. 7 belongs to the chocolate slipped variety. Even though the pit is very close to the surface, the pottery types recovered indicate that this burial belongs to the Middle Mature Harappan Period. Considering the presence of clay lining, the variety of different pots, and the recovery of a complete shell bangle included as a burial good, this burial probably belonged to an individual of higher socio-economic status.

Burial No. 50A (Tr. CF4) and 50B (Tr. CF4 and CE4)

While excavating Burial No. 50A, the presence of another burial, which was later in date and located to its eastern side, was identified. This was assigned a different burial number. It was not assigned number 51 because the numbering of the burials was done when burial pits were traced on plan when this burial was not visible. As number was 51 already used, it was decided to assign this Burial No. 50B.

Burial 50A (Trench CF4)

(Figures 8.71, 8.73)

This primary burial, which was oriented in the north to south direction, belongs to the Middle Mature

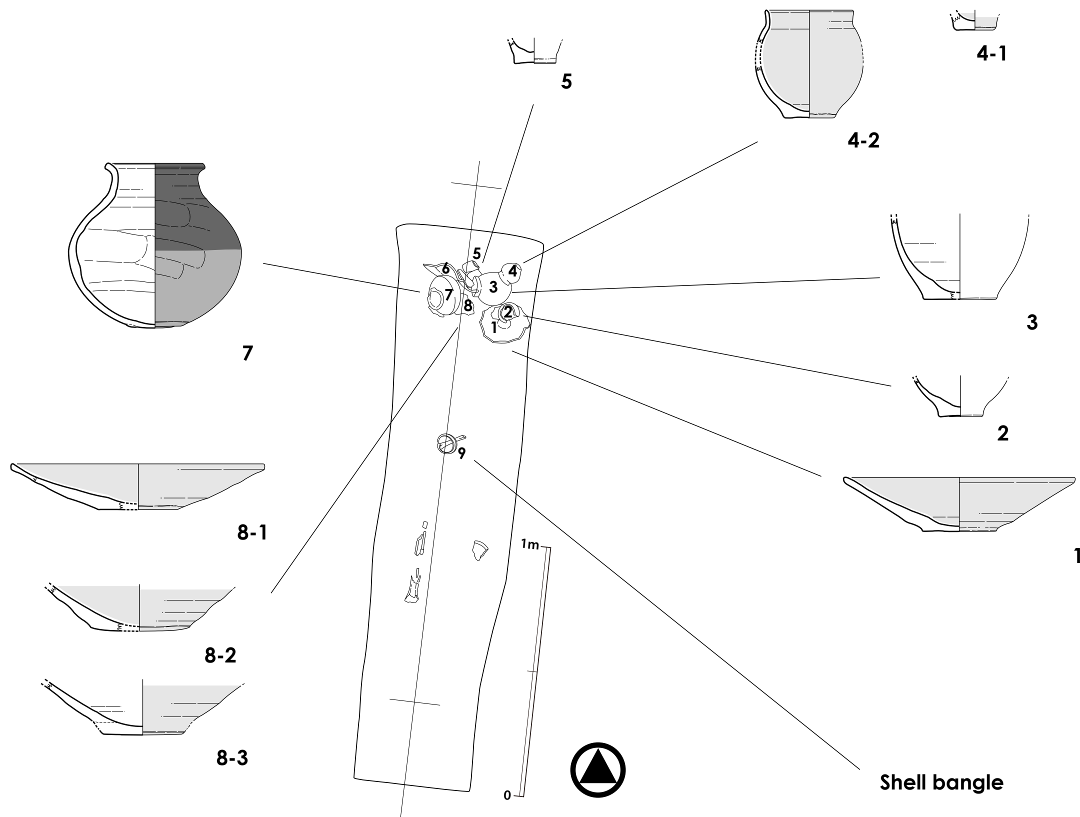


Figure 8.68 Plan of Burial no.49 (1:30)

Harappan Period (Burial Phase II). It is located 90 cm to the west of the eastern section of CF4 and 64 cm to the south of the northern section. The pit of this burial is extraordinarily long and devoid of clay lining. It is 3.13 m long and its width is 80 cm. A northeast part of the pit was damaged by burial 50B, which was dug later. The pit has survived to a maximum depth of 38 cm. The body was placed in an extended supine position with its head towards the north and legs towards the south. The total height of the remains is 1.60 m. Both legs were placed parallel, the feet of the left leg pointing towards south whereas the right leg was turned towards the west. Even though this is a primary burial, few bones have survived. They include the feet and patella of the left leg; femur, patella, tibia and feet bones of right leg; palm bones of right hand; part of right shoulder; upper part of left humerus; and lower jaw and skull. The skull was placed on a slightly higher level and was therefore found facing the south. This skeleton appears to belong to a robust, fully-grown adult. A number of micro steatite beads are found near the ankle of right leg. It is possible that the person was buried with ornaments, suggesting that this burial belongs to a female.

A number of pots (18) were found lined up in the east to west direction immediately to the north of the head. Unlike other burials, in which burial pots were interred close to the northern end of the pit, in this burial, they were placed 60 cm south of the northern end. Pot No. 1, to the extreme eastern end, is a deep flat based dish with flared sides and a featureless rim. As it is damaged, its diameter cannot be measured. It has slightly tilted to the west. Pot No. 2, to the west of Pot No. 1, is a classical Harappan 'S'- shaped jar with a wide mouth, triangular rim, and a groove and tapering flat base. It has shallow ridge just above the base portion. It is 30 cm in height and its mouth's diameter is 15 cm. The pot has fallen slightly to the northwest. To the north of Pot No. 2 is the base of a probable Harappan goblet. It has tilted to the east.

Pot No. 4 is a Harappan goblet with a flat base, slightly concave mouth and flaring sides. It was found



Figure 8.69 General view of Burial no.49, from south



Figure 8.70 Details of Burial no.49

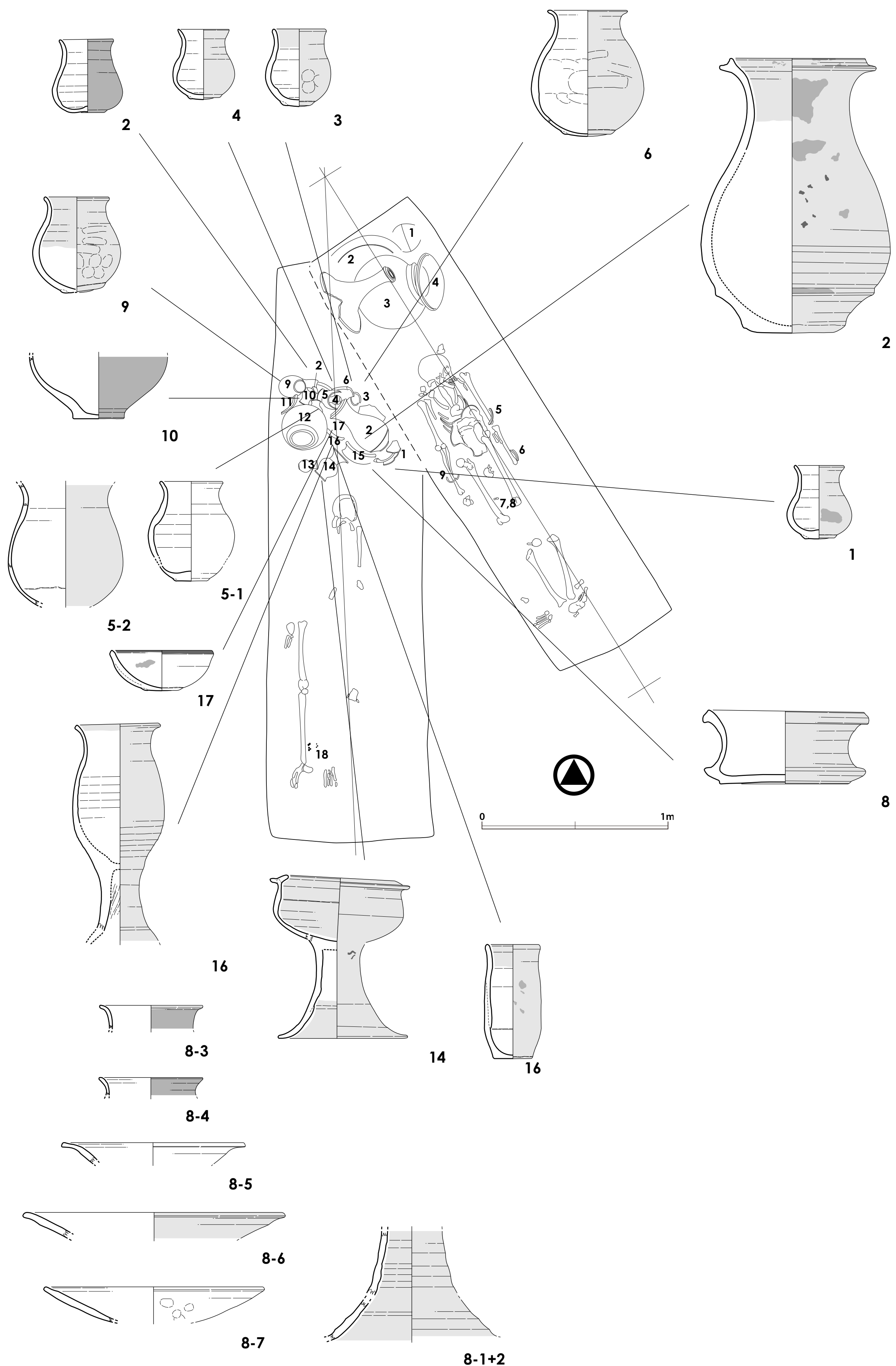


Figure 8.71 Plan of Burial no.50A (1:30)

inside Pot No. 5 and northwest of Pot No. 2. It is 8 cm in length and the mouth's diameter is 5 cm. The pot is intact, but has fallen to the west. Pot No. 5 has also fallen to the west. It is a typical Harappan goblet, large in size. As the measurable portion is damaged and the mouth is hidden beneath other pots, its height and mouth diameter cannot be measured. Pot No. 6 is north of Pot Nos. 4 and 5. It is a fragment of a basin with incurved sides and a round featureless rim. Pot No. 7 is to the west of Pot No. 6. It is also a fragment of a basin with a wide mouth and short out-turned rim. Pot No. 8, to the south of Pot No. 7, is also a Harappan small goblet with an everted rim and wide mouth (diameter 6 cm). It has tilted to the east. Slightly tilted to the east, Pot No. 9 is to the northwest of Pot No. 10 and north of Pot No. 11. It is a slightly bigger goblet with a prominently everted rim. The diameter of this rim is 7 cm. Between Pot Nos. 8 and 9 is Pot No. 10, a small Harappan goblet with a rim base and concave everted rim. It is 8 cm in height with a rim diameter of 4 cm. The pot has fallen towards the south. Pot No. 11 is a fragment of a deep dish with incurved sides and nail headed rim. Pot No. 12 is a large, rimless, Kot Diji type pot situated to the south of Pot Nos. 10, 11, and 18. It is a perfectly round pot, tapering upwards with a rimless narrow mouth. There is a shallow ledge on its shoulder. Its mouth's diameter is 14 cm and it is 20 cm tall. This pot appears to have been placed on slightly higher ground, possibly a mud platform inside the burial. Pot No. 13, to the south of the Pot No. 12, is 8 cm below the level of Pot No. 12. It is a small lota with a round bulbous body, flat base and wide flaring mouth. It is 9 cm in height. It has fallen to the east. To its east is Pot No. 14, which has a unique shape found only at the Harappan Cemetery at Farmana. It is a small vase-on-stand with a short (8 cm), hollow, flaring base and a vase on top. The vase has a globular body, sloping shoulders and everted rim. It is 13 cm in height and the mouth's diameter is 8 cm. It has fallen to the southwest. Pot No. 15, to the south of Pot No. 2 is a pulley-shaped pot rest. The base has a triangular rim whereas the upper edge is beaded undercut. This object is 8 cm in height with a diameter of 17 cm. It has tilted slightly towards the north. This may have been the base of Pot No. 2, a Harappan 'S' shaped jar. Pot No. 16, to the west of Pot No. 15 is a fragment of a typical pear shaped Harappan goblet. Pot No. 17 to its north is a fragment of a large basin-shaped lid. It has tilted towards the east. Between Pot Nos. 5 and 10 lies the upper part of a wide mouthed Harappan goblet (Pot No. 16). Its lower portion is missing. The pot has fallen to the north.

This burial's numerous typical Harappan pots and large burial pit indicate that it belongs to an important person in society.

Burial No. 50 B

(Figures 8.72 - 8.74)

This burial is slightly later than Burial No. 50A. It also belongs to the Middle Mature Harappan Period (Burial Phase II). It is 20 cm to the south of the northern section and immediately to the east of burial 50A. It is oriented 50° in the northwest to southeast direction, and lacks clay lining. Its burial pit is 2.67 m long and 70 cm broad. It has survived to a depth of 25 cm. It is a primary burial, containing the skeleton of a fully-grown female. Almost all the bones are well-preserved. The body was placed in a supine position with feet crossed and head tilted to the east. It is 1.60 m long. Both hands are straight in an attention position. In the lower part of the right hand was found a copper bangle, and in the lower part of the left hand were two bangles along with one large bangle near the joint of humerus and radius-ulna. All three of the bangles on the deceased's left arm are made of shell. All the bones are sturdy, indicating that the skeleton belonged to a very healthy and robust female. The lower and upper jaws are intact and include all the teeth.

To the north of the head near the northern end of the burial pit are four pots. Pot No. 1 is probably a Kot Diji type pot, the mouth and base of which are embedded in clay. It appears to be a globular pot

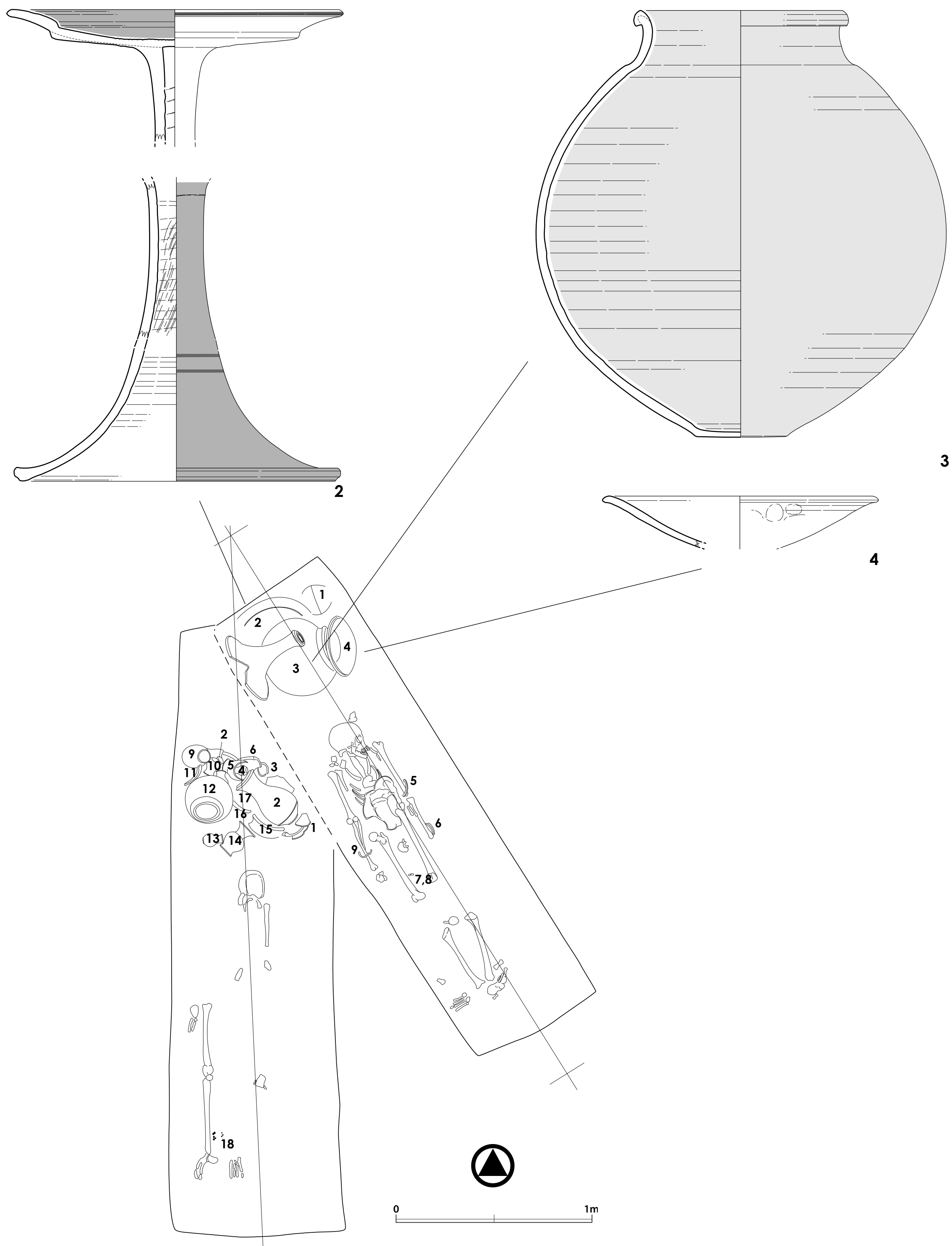


Figure 8.72 Pottery from Burial no.50B (1:30)



Figure 8.73 Burial no.50A



Figure 8.74 Burial no.50B

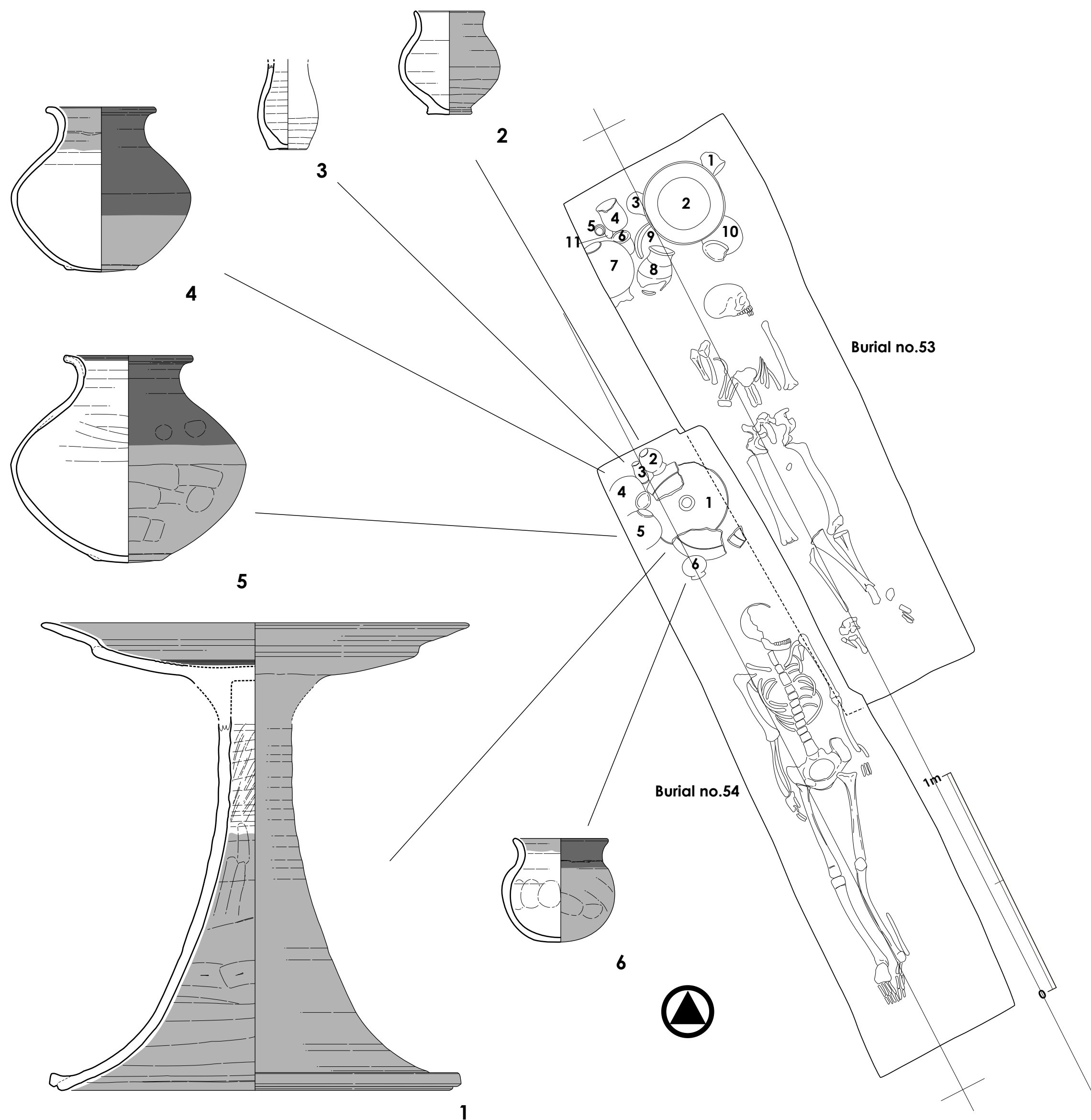


Figure 8.82 Plan of Burial no.54 (1:30)

with flat base and a short everted rim. It has fallen to the west. Pot No. 2 is a large dish-on-stand, the dish of which is separated from the stand and has fallen vertically to the north facing the northern section. The stem of the stand is 20 cm tall and has prominently flared base, the diameter of which is 35 cm. The dish on top is a typical step-sided dish of the Mature Harappan Period with concentric circles in the centre. The diameter of dish is also 35 cm. The stand has tilted and fallen to the east. To the south of the dish portion and east of the stand portion lies Pot No. 3, which is a medium sized storage jar. It is a globular pot with a constricted neck and small flat base. The diameter of the mouth is 23 cm and the height of the pot is 40 cm. This intact storage jar has fallen to the east. On the top is Pot No. 4, a dish with a rounded undercut rim. It is slightly concave in the centre and it was used as the lid of a storage jar (Pot No. 3).

The jewellery and large pots included in this burial as offerings indicate that the woman who was interred had a high status at Farmana, perhaps belonging to an elite class.

Burial No. 54 (Trenches CE4 and CE3)

(Figures 8.82, 8.76, 8.77, 8.80, 8.81)

On the junction of CE3 and CE4 lies Burial No. 54, which is 1.35 m to the west of the southeast peg of

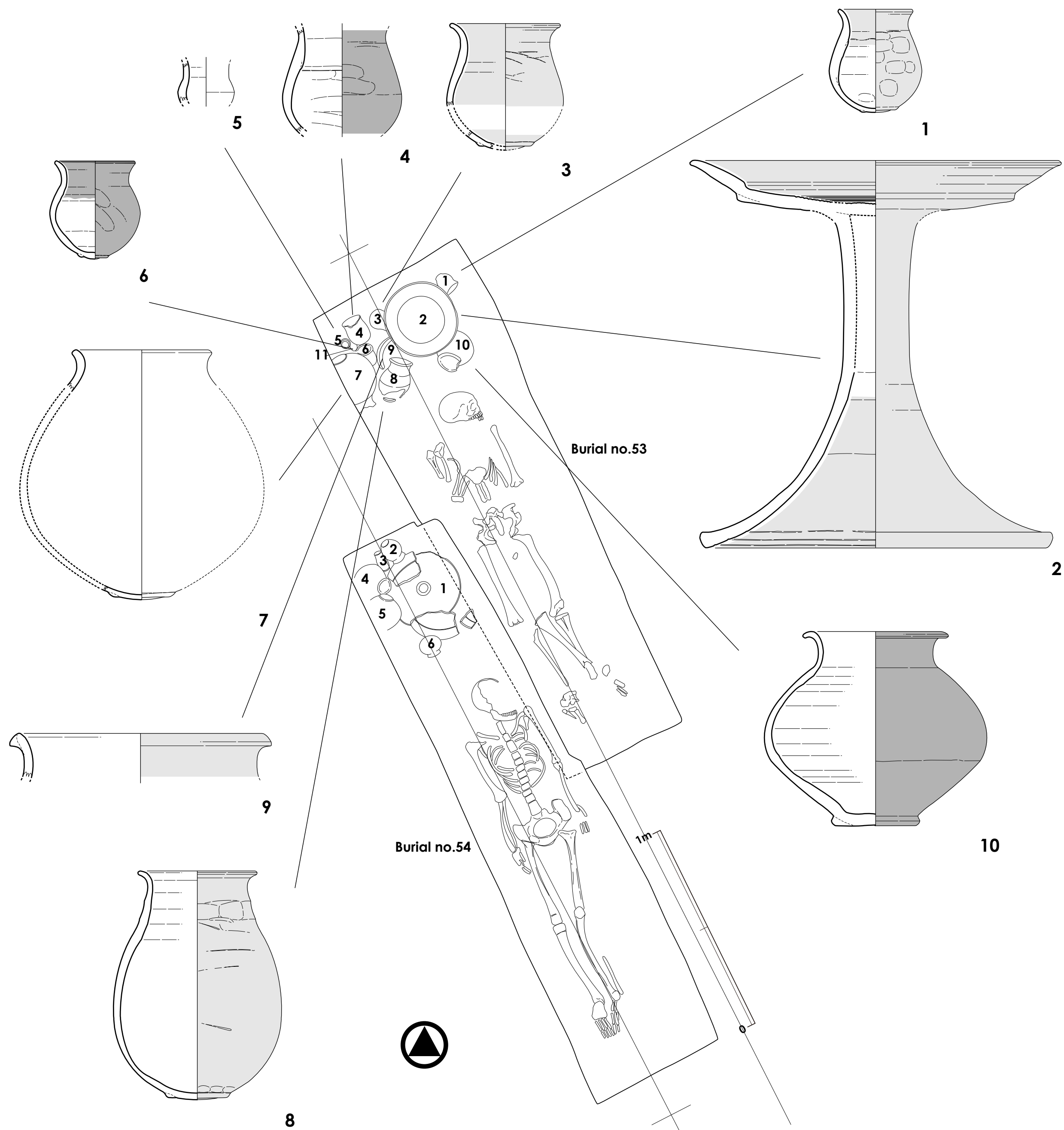


Figure 8.75 Plan of Burial nos.53 (1:30)

the trench. It is just west of Burial No. 53. Its burial pit has damaged part of the western wall of Burial No. 53.

This well-preserved primary burial belongs to the Middle Mature Harappan period (Burial Phase II). Its burial pit is quite long (2.80 m) but relatively narrow (55 cm). It has a 20 cm thick clay lining and has survived to a maximum depth of 35 cm. The burial pit is oriented 20° in the northwest to southeast direction.

Inside the burial pit lies a well-preserved skeleton in an extended supine position. It belonged to a fully-grown adult (possibly male). All the bones except for the frontal part of the skull and the jaw were well preserved and documented in situ. The right leg is straight and the phalanges point to the south whereas the left leg is dragged slightly towards the west and the tibia slightly bent to the east. The phalanges are also straight, pointing towards the south. The right hand is straight but slightly bent to the east at the joints. The head is tilted towards the east. The total height of the



Figure 8.76 General view of Burial nos.53 and 54, from southeast



Figure 8.77 General view of Burial nos.53 and 54, from northeast



Figure 8.78 General view of Burial no.53



Figure 8.79 General view of Burial no.53



Figure 8.80 General view of Burial no.54



Figure 8.81 General view of Burial no.54

human remains is 1.75 m.

To the north of the head in the northern end are 6 pots belonging to Harappan varieties. Pot No. 1 is a big dish-on-stand. The dish-on-stand (Pot No. 1) is quite tall and stands vertical. The dish portion has broken into pieces and fallen around the base. The total height of the pot from base to the top is 35 cm. It has a long stem, which flares towards the base. The base has a slightly raised edge. It diameter is 35 cm. The dish-on-stand includes a typical Harappan step-sided dish with concentric designs inside in the centre. Pot No. 2 is a pear-shaped Harappan goblet with a dish base and wide, slightly flared mouth. It is 9 cm in height and its mouth's diameter is 7 cm. It has fallen to the south. Pot No. 3 is a miniature beaker to the west of Pot No. 2. It has fallen towards the north. It has an 'S' shaped profile with a flat base, wide and slightly flared mouth, and is 9 cm in height. Pot No. 4 is to the west of Pot No. 3. It is a small globular pot with a squat bulging body, concave neck, everted rim and possibly a flat base hidden beneath the sediments comprising the floor of the burial pit. Its mouth's diameter is 9 cm and its height is 12 cm. It has inclined slightly towards the southeast. To the south, in the western section of the pit is a slightly bigger globular pot with an insignificant ring base. Its entire mouth and half of its body is embedded in the trench's section, as such details about its dimensions and shape cannot be given. The pot lies in the north to south direction with its mouth towards the south. Pot No. 6 is small globular pot with a round base, short vertical neck, and slightly everted rim. It is 10 cm in height and its mouth's diameter is 8.5 cm. It has fallen to the south. Except for Pot No. 4, which is of chocolate slipped ware, all the pots belong to the fine red variety.

The person to whom this burial belonged seems to have had a higher status in society.

Secondary Burials

Burial No. 6 (Trench 2)

(Figures 8.83 - 8.85)

This burial is located 6.80 m to the northeast of Burial No. 1 in the northwestern part of Trench 2. It is also a secondary burial, oriented 40° from northwest to southeast. The rectangular burial pit is 2.56 m long and 70 cm wide. It has a deep pit (35 cm) and the pots inside are well preserved. Only two bones were found lying in the pit-a mandible from a fully grown and healthy adult lying 38 cm to the north of the southern end of the pit and 11 cm to the east of western pit-line, and a right humerus 10 cm to the north of the jaw and 22 cm to the east of the western pit-line. It is 30 cm long and oriented parallel to the pit-line.

In the northern end of the pit were stacked 16 pots. In the middle is a large globular pot with a beaded rim 20 cm in diameter. To its east are one dish, one S-shaped jar covered with a lid, one bowl-on- stand, two goblets and one round pot of medium size with a lid which is broken. To its south are three dishes, a large dish-on-stand, the dish of which is detached, and one bowl-on-stand. To its west is a fragment from a dish and a small globular pot with a short out-turned rim and a ring base, and a goblet.

Burial No. 22 (Tr. CF3)

(Figures 8.50 - 8.56)

At a distance of 1 m to the southwest of Burial No. 20 is located Burial No. 22. Like Burial No. 20, it is also oriented 150 in the northeast to southwest direction. The burial belongs to Burial Phase IIB or the Middle Mature Harappan Phase. The length of the burial cannot be measured as it was found just above the Burial No. 23. The southern portion part of its pit, which lies above Burial No. 23, has merged with the underlying burial's pit.

This secondary burial contains pots to the northern end of the pit as well as towards the middle, close to the pelvic girdle of the human remains. The head, shoulder bones, neck and clavicles of

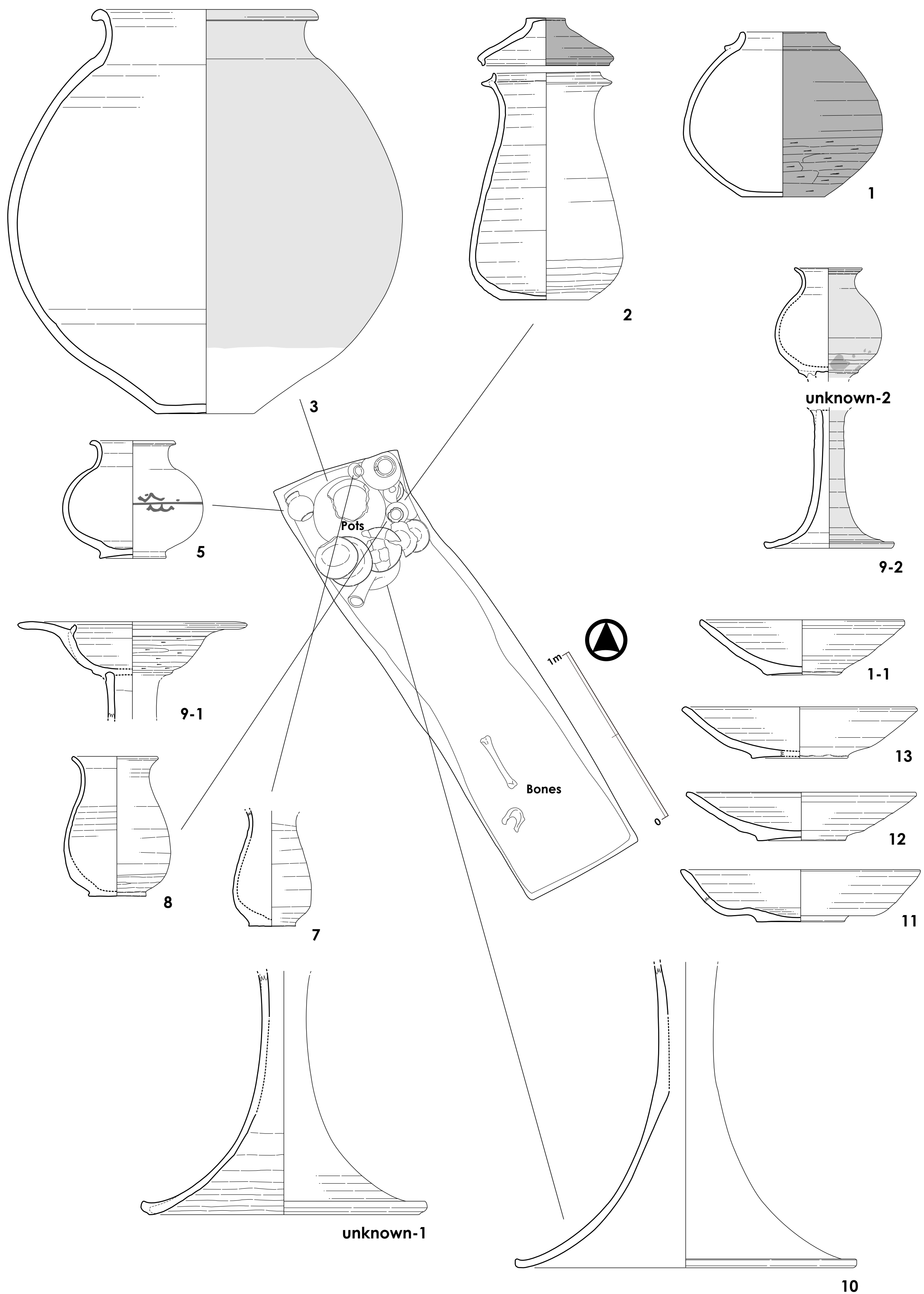


Figure 8.83 Plan of Burial no.6 (1:30)



Figure 8.84 General view of Burial no.6



Figure 8.85 Burial pots of Burial no.6

the deceased are missing. The bones were found in situ include part of the left humerus, rib cage, a few fragmentary vertebrae, pelvic girdle and legs. These were placed in the north to south direction in an extended, supine position. Both the legs have been oriented directly north to south. The right tibia and fibula have been misplaced and were found lying between thighbones. The tarsal and metatarsal bones of the left leg have survived. The position of left hand is not clear, as a major portion of it underlies the burial pots.

The burial contains nine pots and one bi-valve shell, which may have been used as a spoon. All nine pots are of the fine red variety. Of the nine pots, five are located along the northern end of the pit in a straight line from east to west. Pot Nos. 1 and 2 are large goblets, the upper half of which have been sliced due to ploughing. It is therefore impossible to measure the diameters of the rims and height of the pots. Both appear to be the same size and have ring bases. Pot No. 3, which is a lid, lies at the eastern-most end of the line of pots. It is a deep saucer with a flared-out rounded rim and a small round flat base. Just to the south of the lid are two small goblets which have fallen in the north to south direction. They were placed in a straight line from east to west. Of the two, the smaller one on the western side (Pot No. 4) has a diameter of 5 cm and height of 10 cm. It has a pointed flat base and a short everted rim. The other one to its east, Pot No. 5, is identical in shape to Pot No. 4 but slightly bigger with a mouth diameter of 7 cm and height of 10 cm.

Between the goblets (Pot Nos. 1 and 2) is a spoon from a bivalve shell.

Of the four pots placed near the left pelvic bone are two goblets and two beakers. The goblets, which have inclined towards the east, are arranged in a north to south direction. The first goblet on the northern side (Pot No. 6) is a classical Harappan goblet with a round bulbous body, short vertical featureless rim, and tapering flat base. The diameter of the rim is 8 cm. and the goblet's height is 13 cm. To its south is Pot No. 7, which is also a typical Harappan goblet similar to Pot No. 5 but slightly smaller in size. Its base is slightly broken. The diameter of the mouth is 6 cm and it is 9 cm in height. Pot Nos. 8 and 9 are miniature beakers (similar to the brandy cup to which Mortimer Wheeler referred at Harappa). These are arranged in the east to west direction. One of them has inclined to south and the other towards north. Of the two Pot No. 8, which is to the west, is slightly bigger and has slight 'S' profile with a wide mouth (5 cm diameter) and broad flat base. It has a vertical featureless rim. It is 9 cm tall. Pot No. 9 is a small beaker lying to the east of Pot No. 8. It is almost cylindrical with a slightly flared mouth and broad flat base. The diameter of the rim is 5 cm and is 8 cm tall.

It is quite likely that the beakers and goblets in the burial contained some kind of liquid when they were interred. A lid must have been used to cover Pot No. 2, one of the larger goblets. Pot Nos. 1, 2 4, 5 and 6 have been partially destroyed due to ploughing. Pot Nos. 7, 8 and 9 are preserved in good condition.

Considering the presence of a large number of classical Harappan pots in the burial, it is quite likely that the deceased had a high status in society.

Burial No. 39 (Tr. CH4)

(Figures 8.86 - 8.90)

Burial No. 39 is the largest of the burials at Farmana in terms of size. It is located 65 cm to the north of the southern section of CH4 and 2.20 m to the east of the western section. Its pit is oriented in a north to south direction and measures 3.10 m in length (from north to south) and its average width varies from 1.50 m towards southern end to 1.70 m towards northern end. It is survived to a maximum depth of 90 cm. The burial belongs to the Burial Phase II of the Middle Mature Harappan Period.

The burial pit is devoid of clay lining. It is secondary burial as it contains two skulls, a jaw, and a couple of long bones. They are 80 cm to the west of eastern section of the pit and 1.60 m to the north of the southern section of the pit. The two skulls

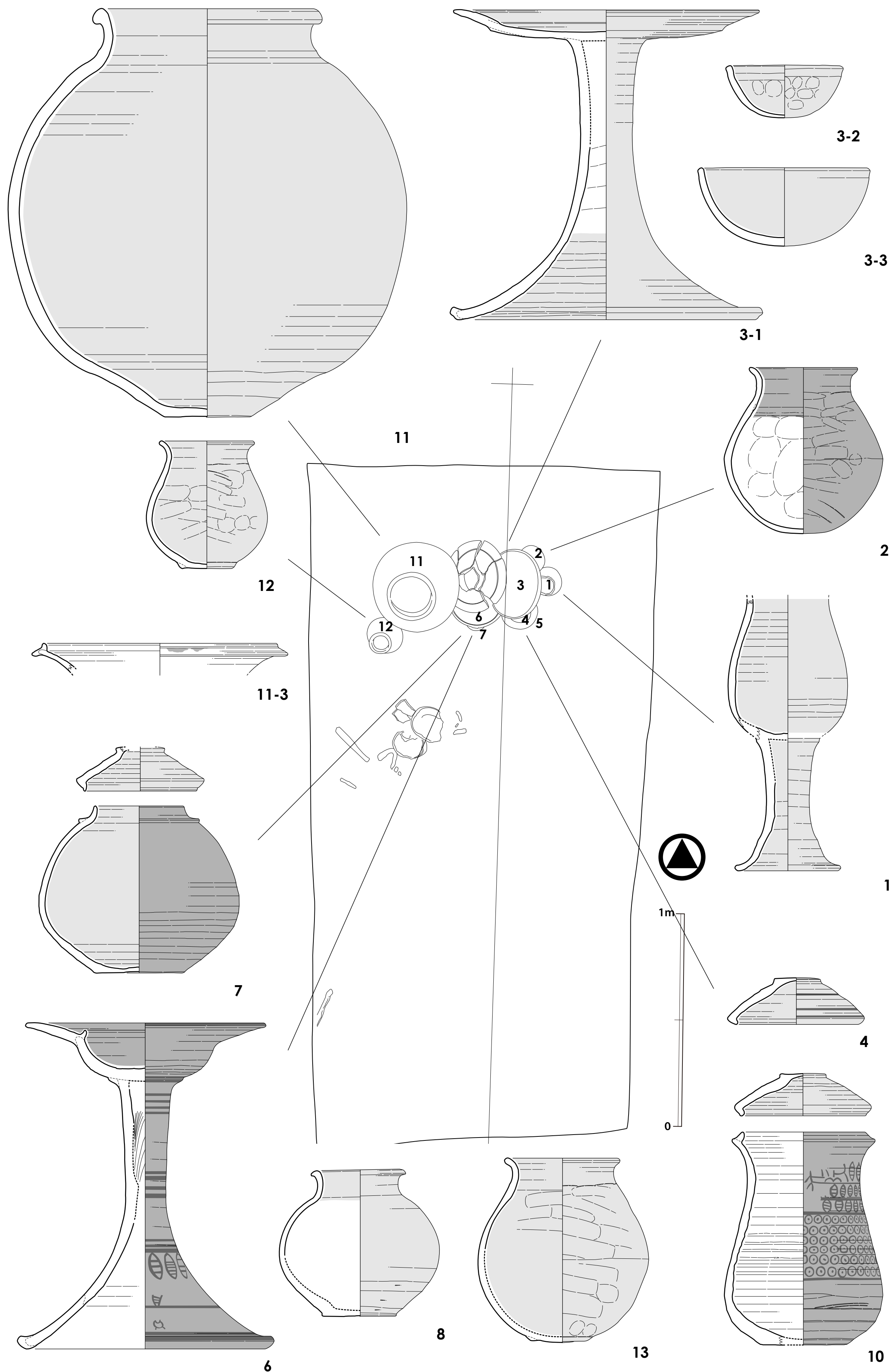


Figure 8.86 Plan of Burial no.39 (1:30)



Figure 8.87 General view of Burial no.39, from south



Figure 8.88 Details of Burial no.39



Figure 8.89 Details of Burial no.39



Figure 8.90 Details of Burial no.39

found in this burial are at two different levels. The upper level is 15 cm higher. The skull on the lower level is has been cut in half but it is not clear whether it is slit vertically or horizontally. To its southwest is a mandible that has fallen upside down. Its teeth are still embedded into the ground. The mandible appears to belong to the skull on the lower level. Both the skull and mandible are very robust, indicating that they belonged to a healthy individual. The other skull, which is 15 cm above the lower skull, is more or less complete but lacks a mandible. It is facing east. 20 cm too its west at the same level are a couple of long bones near the western wall of the pit. These consist of the radius from both hands. They were placed at the same level as the skull, but one of the complete radiuses has slipped down. It gives the impressions that it has been positioned vertically. In the section of the southern half of the western pit line, at a distance of 60 cm from the southern end, a long bone (likely tibia) lies obliquely. It is hardly 15 cm below the surface. Some of the human remains underlie the unexcavated section to the west. The position of the bones indicates that they are not associated with the two skulls and offering pots included with the burial. Most probably, this is part of a skeleton whose burial pit was destroyed when the pit for Burial No. 39 was dug.

In all, 12 Harappan pots were found placed to the north of the skulls at a distance of 25 cm. The pots were found arranged in a row running from east to west. Burial pots include a storage jar, two dish-on-stands, a miniature 'S' shaped jar, a goblet, 4 globular pots and three lids. Pot No. 1, which is an elongated pot with a round base, slightly narrow mouth and probably an everted rim. It is to the extreme east of the row, still standing vertical. As the rim portion is broken, the height and rim diameter can not be measured. Pot No. 2 is a medium sized globular pot with a round base and short out-curved rim. It is 15 cm in height with a mouth diameter of 10 cm. It is to the northwest of Pot No. 1 and still stands vertical. Pot No. 3, which overlies Pot Nos. 1 and 2, is a large dish-on-stand with a long stem, flared sides, beaded rim and a step-sided dish on top. The stem is 17 cm long. The dish on top is a typical mature Harappan step-sided dish. The diameters of the base and of the dish are same (40 cm). The dish-on-stand has inclined towards the west. The base is intact but the dish on top has broken into number of fragments that remain in situ. Pot No. 4 is a lid covering Pot No. 5. It appears to be a deep saucer with pointed flat knob. The diameter of the lid is 14 cm, which is 6 cm deep in the centre. Pot No. 5 is a globular medium-sized pot, the mouth of which is covered with lid (Pot No. 4). Since the mouth and base are covered it is difficult to determine the shape of pot. It was found standing without any disturbance. This pot is located to the south of Pot No. 2 and beneath the stand portion of Pot No. 3. Pot No. 6 is a bowl-on-stand, located to the west of Pot No. 3, which is a dish-on-stand. The major portion of the bowl-on-stand and the stem are hidden below the dish portion of dish-on-stand (Pot No. 3) and part of Pot No. 11, which is a storage jar. The bowl-on-stand has a short stem with a flared base and a featureless, rounded rim. The bowl-on-stand is roundish and deep, with a long flat projecting rim. The inner diameter of the bowl is 13 cm and the rim is 6.5 cm broad. The height and diameter of the base can not be measured as it is hidden and inclined towards the north. Below the base of bowl-on-stand are Pot Nos. 7 and 8. Pot No. 7 is a saucer shaped lid with a circular disc knob with a diameter of 6 cm and a concave surface. The diameter of the lid is 14 cm. Pot No. 8, which is covered by the lid (Pot No. 7), is probably a globular pot. The base and mouth of Pot No. 8 are hidden. The pot and lid have inclined towards the southwest. To the west of Pot No. 6, which is a bowl-on-stand, is a small 'S' shaped jar (Pot No. 10) which was covered with a lid (Pot No. 9) that has slipped towards the southern side and was found lying vertically to the side of the 'S' shaped jar. The lid is like a deep saucer, with incurved sides and a flat disc knob. The diameter of the lid is 15 cm and that of disc knob is 5.5 cm. It is not broken. The 'S' shaped jar,

which is to the north of the lid, is hidden partly by a lid and dish portion of Pot No. 11. The 'S' profile pot has a triangular rim and probably a flat base, which is not visible. Pot No. 11 is a globular storage jar located on top of Pot No. 10 and to the west of Pot No. 3. It has a perfectly globular body and constricted neck. The base is not visible but, given the other examples, it probably has a narrow flat base. The pot is 40 cm tall and has a rim diameter of 24 cm. The pot is still standing vertical. It appears that this pot was intentionally placed on a higher level, possibly atop a clay base. At the same level is Pot No. 12, which is a medium sized globular vessel with a slightly elongated round body. The rim is prominently everted and has a diameter of 13 cm. This pot is 17 cm high. The pot is located to the SW of Pot No. 11 and was found standing vertical.

This is the largest burial found at Farmana, with numerous classical Harappan pots. This is indicative of the higher socio-economic status of the person interred. The pit is much larger than would have been necessary for the human remains interred, which take up very little space. Its size must indicate that the social status of the person was higher than that of common people. Like Burial No. 38, it has the remains of two individuals in the form of two skulls and a few long bones. It is not clear whether or not both were buried simultaneously. We clearly identified two levels, each of which contained a skull as well as pots. Pot Nos. 11 and 12, which are at the level as the skull on the higher level, probably belong to a later phase whereas the remaining pots (Pot Nos. 1 and 10) are associated with the skull at the lower level, probably indicating that it was previously interred. It is likely that the same pit was re-opened later. At this time, a second set of burial pots and human remains were placed at a higher level than the earlier interment. Those who buried the later individual were probably fully aware of the presence of earlier burial. All the pots belonging to the earlier burial (Pot Nos. 1 to 10) have the same fabric whereas the pots included with the later burial have different a fabric and surface treatment. It is likely that the two individuals, buried at different times, may actually be related to one another other.

Burial No. 55 (Tr. CF4)

(Figures 8.91 - 8.92)

This burial is located 1.55 m to the south of the northern section of Trench CF4 and 75 cm to the east of Burial No. 53. It is a secondary burial, oriented in the north-south direction and lined with a layer of clay plaster 20 cm thick. The burial pit is 2.06 m long and its average width is 70 cm. It has survived to a maximum depth of 65 cm. The burial consists of a few long leg bones (including a left femur, right tibia, and broken left tibia) in its southern part. Along the northern section of the pit are several long arm bones. No other burial goods were found and it is therefore impossible to properly assign this burial to any particular cultural period or burial phase.

Burial No. 58 (Tr. CD4)

(Figures 8.93 - 8.94)

At a distance of 2.55 m south of northern section of Trench CD4 and 60 cm to the east of the southern end of Burial No. 56 is located Burial No. 58. It is a secondary burial, oriented from north to south. The pit is lined with clay plaster that is 30 cm thick. It is 3.25 m in length and the width varies from 1.40 m towards the southern end to 1.75 m in the northern end. The burial pit has survived to a depth of 80 cm. It includes a fragment of a possible humerus, which was placed in an east to west orientation at a distance of 47 cm to the west of eastern wall of the pit and 1 m south of northern wall. It is devoid of any other burial goods. In the absence of pottery it is difficult to assign this burial to any cultural period or burial phase.

Even though it is lacks burial goods, its large clay lined pit gives the impression that the burial belonged to a higher status individual.

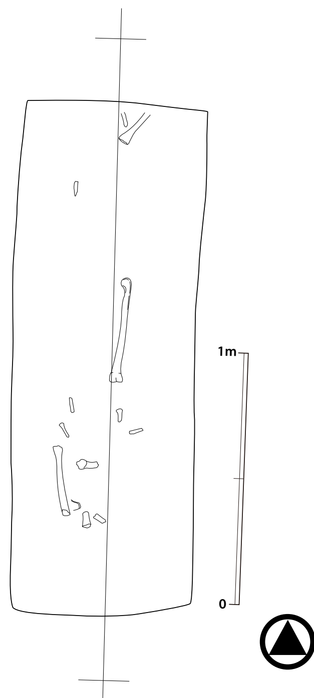


Figure 8.91 Plan of Burial no.55 (1:30)



Figure 8.92 General view of Burial nos.55 and 56, from north

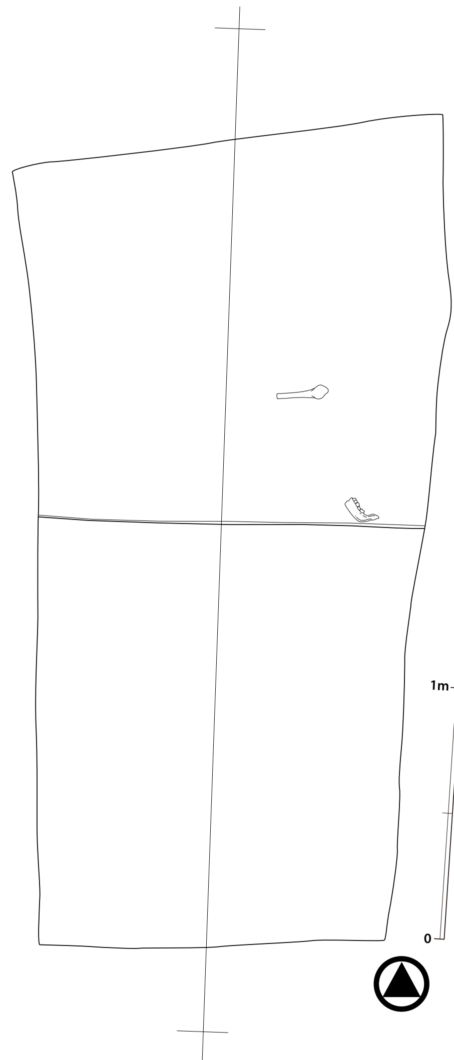


Figure 8.93 Plan of Burial no.58 (1:30)



Figure 8.94 General view of Burial no.58, from south

5 BURIALS OF PERIOD-IIC

In all, 29 burials from Period-IIC have been excavated. Most of the burials (15) are primary, 10 are secondary and 4 are symbolic. Five burials from this period have a clay-lined coffin.

Primary Burials

Of 15 primary burials, 11 are oriented in the northwest to southeast direction and two each run in the northeast to southwest and north to south directions.

Burial No. 8 (Tr. CD3)
(Figures 8.95 - 8.96)

In the middle of the trench along its eastern margin is Burial No 8. It is 2.66 m to the north of the southeast corner of the trench (the southern end of the burial pit). A very small portion of this burial extends into the adjoining trench (CD2). It is a primary burial belonging to Burial Phase III of the Late Mature Harappan Period. The burial pit, which is rectangular in plan, is oriented 450 in the northwest to southeast direction. It is 2.10 m in length and 80 cm in width. As the burial is close to the surviving surface and in the ploughing zone, the burial pots and skull it contains are partially damaged. The original depth of the pit, which has survived in the SE corner, was 25 cm. In the remaining corners it has only survived to the depth of 10 cm. Though the skeleton inside the burial appears to be primary, its left hand, side ribs and left hand are missing. The total height of the skeleton is 1.64 m. The bones missing include those of the neck, vertebrae, left pelvis, phalanges and shoulder bones. The body was placed in oriented in a northwest to southeast direction along with the pit, with its head towards the northwest and legs towards the south. It was placed in a supine position facing upwards. Both the legs and right hand are straight and vertical. However, the toes of the leg point towards the west. Both legs are in a good state of preservation, including the right kneecap. Six of the right ribs and the back portion of the skull have survived. The front of the skull, including mandible and upper jaw are missing.

To the north of the head were found four burial pots, all belonging to the red ware variety. They include one large bowl, one basin, one small bowl and a goblet. Pot No. 1 is a large bowl made of red ware. It is large, with convex sides, a featureless rim and large bulbous body. The diameter of the pot is 23 cm and it is 13 cm deep. This bowl was placed inside the basin (Pot No. 2). The details of the basin cannot be determined as it has broken into pieces, but it had a tapering flat base. Pot No. 3, a wide-mouthed goblet, is survived only by a few potsherds. It has a prominent everted rim, spherical body and probably had a flat base. Pot No. 4 is a small convex-sided bowl with a featureless rim. The diameter of the body is 13 cm. As it is half broken, the height cannot be measured. Apart from these pots, no other burial goods were found in this burial. The person to whom this burial belongs probably had a better status in society.

Burial No. 10 (Tr. CF3)
(Figures 8.97 - 8.99)

This burial, which belongs to Burial Phase III or the Late Mature Harappan Period, is located 1.20 m to the north of the southern trench line of CF3 and 0.83 m to the east of the western trench line. This is a primary burial, but some bones are missing. These include the left hand, radius and ulna of the right arm, and the entire skull. There is no disturbance to the pit, so it is unclear why some of the bones are missing. The average depth of the burial pit is 18 cm. It is slightly deeper (20 cm) to the southern end. It is a rectangular pit measuring 2.50 m from north to south and 65 m from east to west.

The position of the skeleton in the burial pit is in a runs roughly northeast to southwest, with the head portion towards the north and the legs towards the south. The legs of the skeleton, which are well

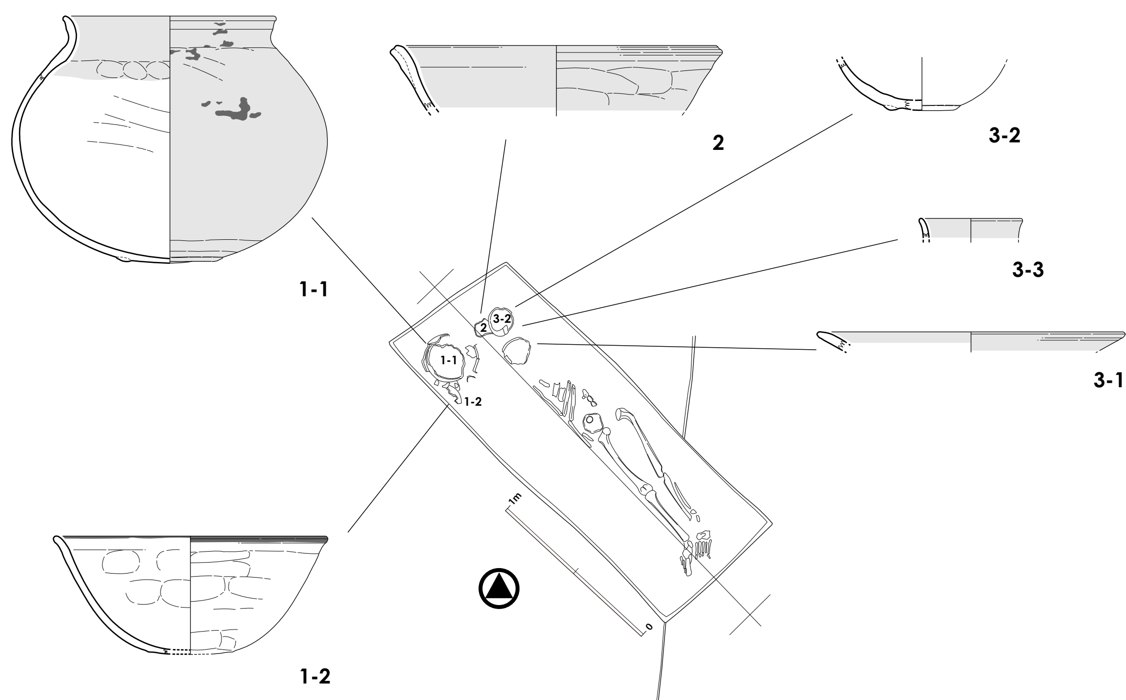


Figure 8.95 Plan of Burial no.8 (1:30)



Figure 8.96 General view of Burial no.8, from southwest

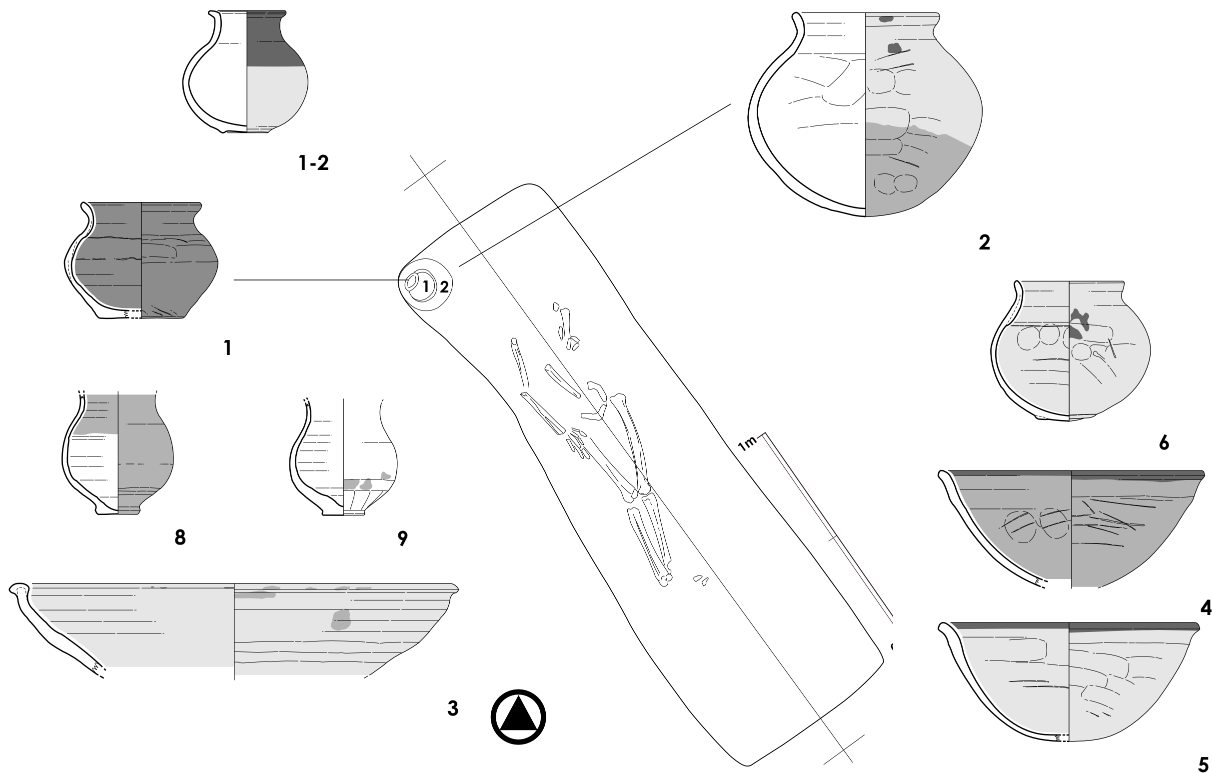


Figure 8.97 Plan of Burial no.10 (1:30)

preserved, were placed close to one another. They are so close that the legs touch at the knees and ankles. The feet bones are not visible and may have dissolved into the soil. The talus and other tarsals of the right leg are preserved. The right tibia and fibula are in good state of preservation and together they are 31 cm long. The left tibia is 32 cm long. The left fibula was not found. The pelvis bone is visible but damaged. A few vertebrae and rib bones are present but highly brittle. The right humerus was found partially broken. The radius and ulna of the right hand are missing, but a complete palm was preserved. It is upside down straight along one outer edge of right femur.

In the northwest corner of the burial pit are two globular pots that were placed vertically. The smaller one was placed on the top of the larger one, serving as a lid.

Burial No. 11 (Tr. CH3)

(Figures 8.100 - 8.104)

This primary burial is oriented in the northwest to southeast direction. Its pit is located 20 cm to the north of the southern trench line (CH3) and 2.40 m to the west of the eastern trench line. The burial pit is perfectly rectangular. It is 2.10 m long and 65 cm broad. Only 5 cm of the pit's depth has survived. This is the burial of an adult that placed in a supine position with its head tilted towards the east. The head is towards north and its legs point towards the south. The total height of the skeleton is 1.70 m and it is in a good state of preservation. This burial belongs to Burial Period IIC of the Late Mature Harappan Period. The legs are spread straight whereas the lower extremities were placed in such a way that the toes touch one another. The hands were placed on the abdomen, folded above one another. Because the burial is close to the surface, the upper part of the skull was sliced in the process of ploughing the field. The pelvis, rib cage and vertebrae are in a relatively good state of preservation.

To the north of the head were placed four pots, all belonging to the red variety. Of the four pots, two are small Indian lotas that are globular with small everted rims, one was a rim and one a basin, only a fragment



Figure 8.98 General view of Burial no.10, from south



Figure 8.99 Details of Burial no.10

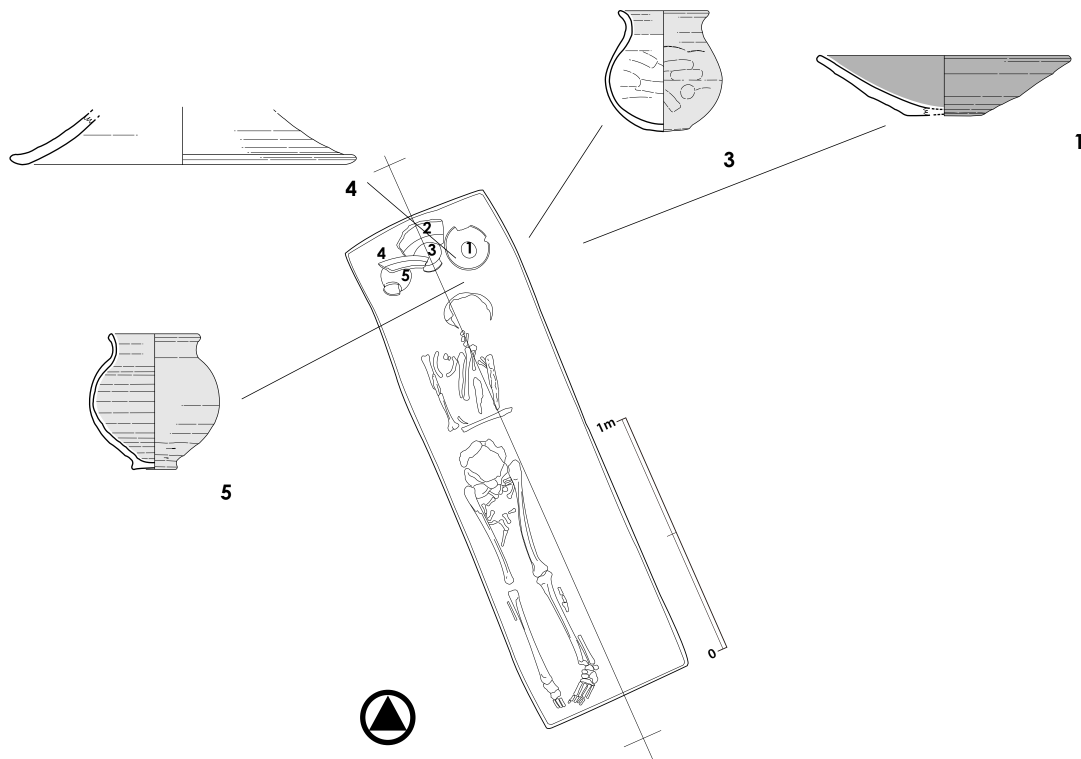


Figure 8.100 Plan of Burial no.11 (1:30)

of which has survived. No other burial goods were found associated with this burial.

Burial No. 18 (Tr. CE3)

(Figures 8.105 - 8.109)

Burial No. 18 is one of the more important primary burials found the site. It belongs to Burial Phase III of the Late Mature Harappan Period. Its burial pit is located 2.70 m to the north of the southern trench-line (CE3) and 30 cm to the east of the western line. The burial is perfectly oriented in the north to south direction. It is 250 m long and 58 cm wide and has survived to a depth of 13 cm. The body inside the pit was found in supine position with its head tilted towards the east. The total length of the skeleton is 1.65 m. The left femur, right tibia and fibula are missing, and the right radius-ulna is also missing. The lower jaw and shoulder bones are not visible. The skull, which is slightly elongated, is preserved and in good condition. The vertebrae, ribs, pelvic girdle, both humeri, left radius, and right femur are relatively well preserved.

To the north of the head were found six burial pots, all of which are of a fine ware variety. Pot No.1, which is close to the skull, is a dish-on-stand belonging to a typical Mature Harappan type. The dish is broken, but the stand is intact and has a very large flare at the base. The total height of the stand is 22 cm and the diameter of its base is 24 cm. The dish-on-stand has tilted towards the north and the dish portion has broken into pieces. Pot No. 2, which is immediately to the west of Pot No. 1, is a Kot Diji type pot with a round body, possibly flat base, and a hidden short everted rim. Pot Nos. 3, 4, 5 are typical Harappan beakers of different sizes. These are small and cylindrical with flat narrow bases. These are located in a line running from north to south along the western edge of the pit. There appears to be a fragment of a goblet between the line of beakers and the dish-on-stand.

Burial No. 20 (Tr. CF3)

(Figures 8.110 - 8.113)

This burial is located 60 cm to the west of



Figure 8.101 General view of Burial no.11, from northeast



Figure 8.102 Details of Burial no.11



Figure 8.103 Details of Burial no.11



Figure 8.104 Details of Burial no.11

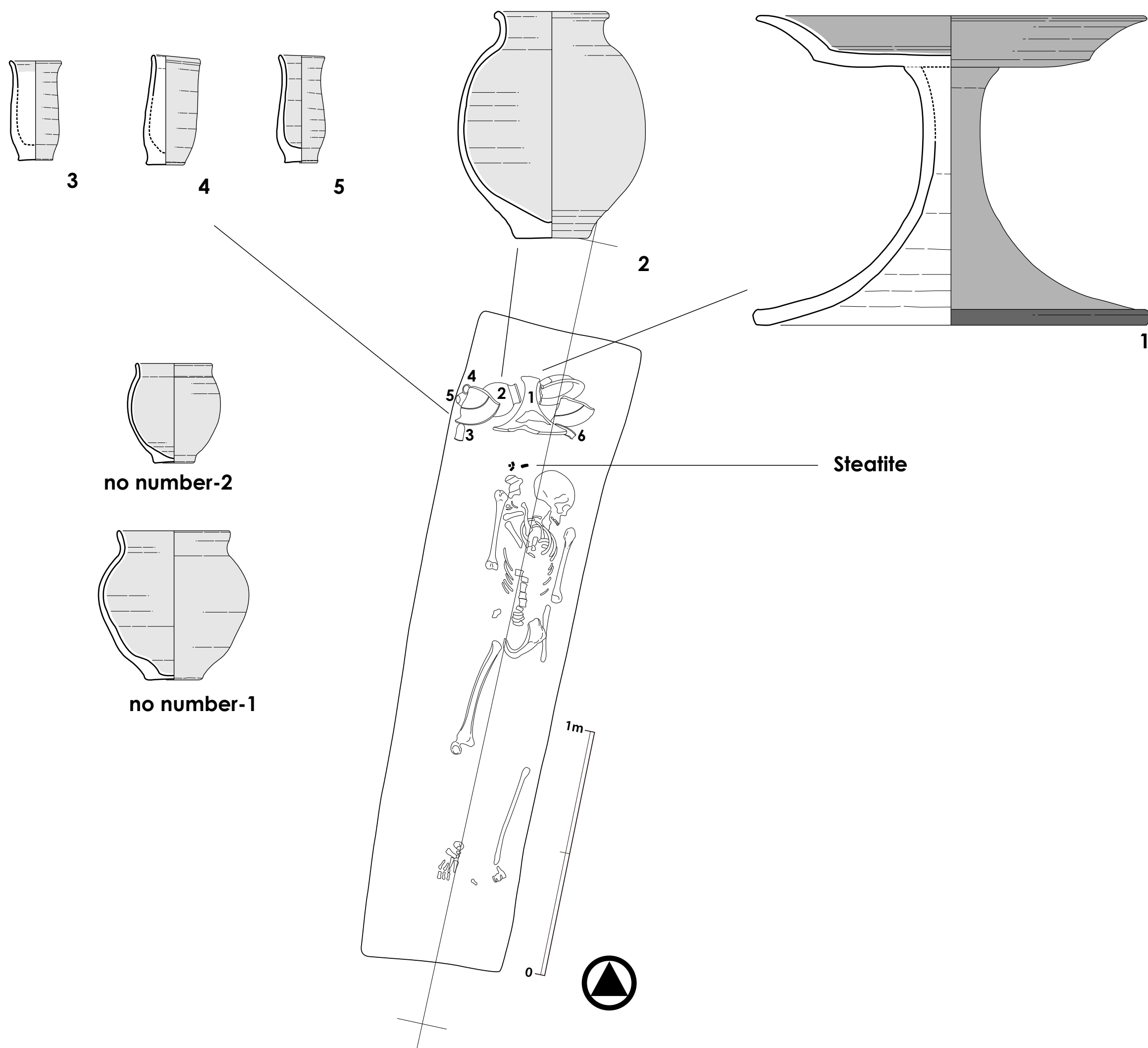


Figure 8.105 Plan of Burial no.18 (1:30)

eastern trench line (CF3) and 2.80 m to the north of the southern trench line. This burial is one of the best-preserved primary burials, oriented 150 in the northeast to southwest direction. It belongs to Burial Phase III of the Late Mature Harappan Period. The burial pit is 2.25 m long and its average width is 72 cm. The pit has survived to a maximum depth of 30 cm. This pit has partially destroyed the northern side of Burial No. 21, which was interred earlier than than Burial No. 20. It is quite likely that the earlier pit was partially destroyed because the people who interred Burial No. 20 were not aware of the previous burial.

The skeletal remains found inside the pit are in the usual supine position facing upwards. All parts of the body are in a good state of preservation. The total height of the skeleton is 1.78 m. Both legs are in a straight position towards south. However, the left foot is turned towards east and the right is straight pointing towards south. Both hands point straight towards the south in an attention position. The pelvis, rib cage, vertebrae, shoulder, collar-bones and skull are intact. The head, which is located to the north and facing upwards, is in extremely good condition. All the teeth and lower jaw are well preserved and were found in situ. Based on the From the facial bones, the person must have had a sharp countenance. It appears to be the burial of a female, as it has number of ornaments decorating its body. Along the lower portion of tibia and fibula were found numerous steatite micro-beads, suggesting the presence of ankle ornaments. In the left hand are three shell bangles, two near the wrist and one at elbow. In the right hand are two sets of copper bangles. At the wrist is a set of 3 bangles, whereas at the lower parts of the humerus was



Figure 8.106 General view of Burial no.18, from east



Figure 8.107 Details of Burial no.18



Figure 8.108 Details of Burial no.18



Figure 8.109 Details of Burial no.18



Figure 8.110 General view of Burial no.20, from west



Figure 8.111 Details of Burial no.20



Figure 8.112 Details of Burial no.20



Figure 8.113 Details of Burial no.20

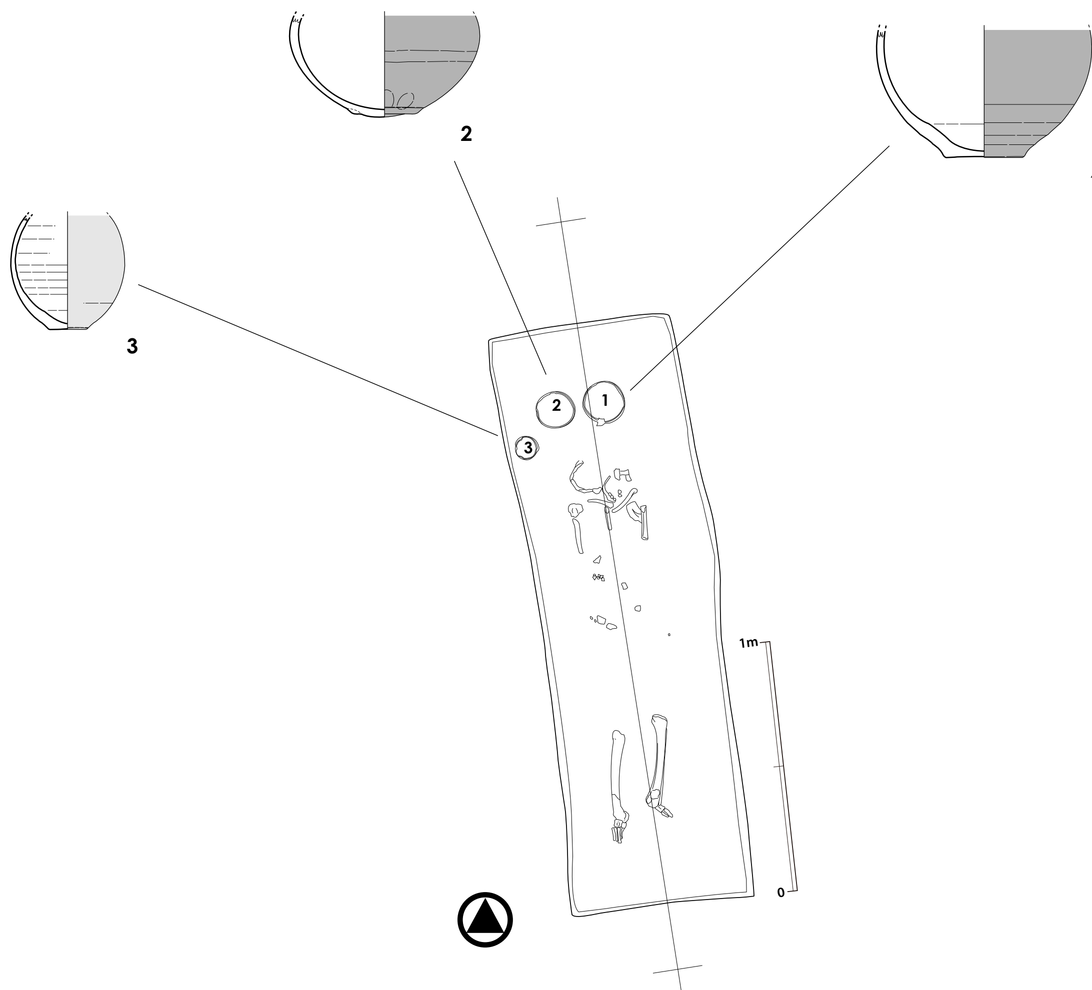


Figure 8.114 Plan of Burial no.24 (1:30)

a set of two bangles. The copper bangles have fused together. In the left ear was found a copper earring.

To the north of the head were found two fine red ware pots. Pot No. 1 is a circular incense burner on a stand with a step-sided rim. It is 5 cm broad, the total height of which is 27 cm. The diameter of the circular surface is 10 cm and the sides are 4 cm high. The incense burner-on-stand has fallen in the east to west direction with its mouth towards east. It has a short tubular stand with a flared base. The diameter of the flared base is 25 cm. There is one more pot, probably a goblet, immediately to the west of the Pot No. 1, which has been assigned Pot No. 2. The upper part of the vessel has been damaged and only part of its base has survived. This is one of the few burials oriented in northeast to southwest direction.

Based on the presence of numerous beads, bangles and earrings, the economic position of the person appears to be high. At the same time, the small number of pots seems to suggest that the social position of the person may not be high.

Burial No. 24 (Tr. CE3)

(Figures 8.114 - 8.116)

Located towards the northern part of Trench CE3, is a rough burial oriented 20° in the northwest to southeast direction. It is 2.50 m to the west of the eastern section and 1.30 m to the south of northern section of the trench. It belongs to Burial Phase III of the Late Mature Harappan Period. The burial was badly disturbed as it lies in the ploughing zone. The pit only survived to a depth of 5 cm. It is 2.35 m long and its average width is 70 cm. No clay lining is visible in the case of this burial.

The skeletal remains positioned in the north to south direction with its head towards north and



Figure 8.115 General view of Burial no.24, from south



Figure 8.116 Details of Burial no.24

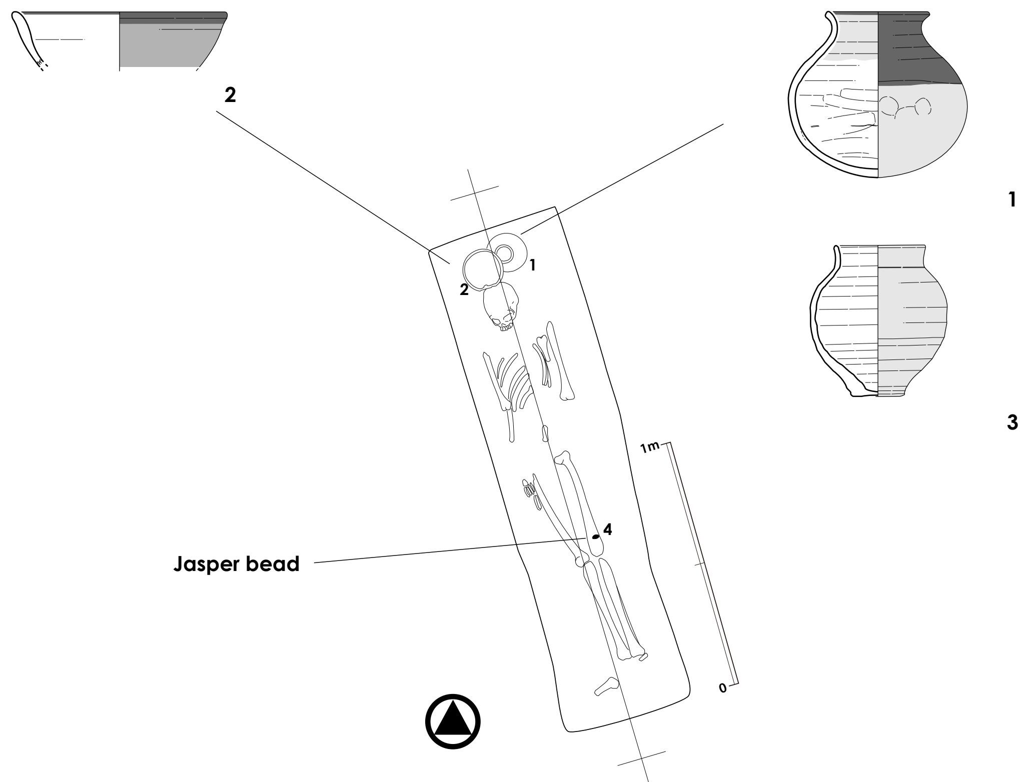


Figure 8.117 Plan of Burial no.26 (1:30)

legs towards south. The lower part of skull, cervical and neck bones, both humeri, part of the vertebrae and pelvic girdle, and both lower extremities survive. The body was placed in an extended position facing upward, with both its legs and hands straight. The phalanges of the right legs were placed pointing south and those of the left leg were twisted towards the east. Both the humeri are straight but the positions of radius and ulna on either side is not clear, as they have been destroyed. The total height of the surviving skeleton is 1.50 m.

To the north of the body, at a distance of 15 cm, are 3 pots placed horizontally from east to west. Pot Nos. 1 and 2 are medium-sized globular pots with round bases and Pot No. 3 on the extreme west is probably a part of goblet.

Considering the interment of only 3 pots and the absence of a clay coffin, the socio-economic status of this person does not appear to be very high.

Burial No. 26 (Tr. CF3 and CF4)
(Figures 8.117 - 8.121)

Located on the northern bands of CF3 and CF4 is the primary burial of an adult oriented 35°in the northwest to southeast direction. The pit is located 2.26 cm to the west of the northwest peg of CF3. The pit was lined with a layer of clay-plaster 20 cm in thickness on all sides. The pit is 2 m long with an average width of 50 cm. It has survived to a depth of 25 cm in the center and 15 cm in the elevated area. Some of the bones of this skeleton include the cervical vertebrae, clavicles, thoracic vertebrae, lumbar vertebra, left radius and ulna, and carpals and metacarpals. The phalanges are missing.

The body was placed in an extended supine position. The legs were brought together and placed towards the east, whereas both the hands were placed straight pointing towards the south. The head of the person was kept straight, facing the south. It appears that the pit was dug deep in the centre and was elevated towards the north. The head of the person has therefore tilted slightly downwards. Both legs are well-preserved however the left tarsals are missing. The right tarsals have been detached from the body and are lying a slight distance towards the west. Both the shoulder bone and humerus are well-preserved. In



Figure 8.118 General view of Burial no.26, from south



Figure 8.119 Details of Burial no.26



Figure 8.120 Details of Burial no.26



Figure 8.121 Details of Burial no.26

the case of the right hand, the palm was found close to the upper portion of the right femur. The total height of the skeleton 1.62 m. Rodent activity is probably responsible for the damage to the skeleton.

The deceased was buried with a necklace of banded agate, however only one bead has survived. It was found on top of the left patella. This flat, globular bead was made of with a white band.

To the north of the head were found three pots, which had been placed in a straight line from east to west. The one on farthest to the east is a small globular pot with a round globular body and short a out-turned rim. It belongs to the chocolate-slipped ware variety. The pot is 13 cm high and has a mouth diameter of 8 cm. Immediately to its west is a wide shallow basin made of coarse red ware. It has a diameter of 17 cm and is 6 cm deep in the middle. It belongs to a local variety, slightly thick in section and made of tempered clay. Pot No. 3 is beneath Pot No. 2. It is probably a red ware Harappan goblet with a short vertical neck and round bulbous body. It short narrow neck. All three pots are vertical. As the burial contains only 3 pots and limited jewellery in the form of beads, the person's economic status appears to have been somewhat low.

Burial No. 35 (Tr. CH3)

(Figures 8.122, 8.124)

In the middle of Trench CH3, at a distance of 2.60 m to the south of northern section and 2.90 m to the west of burial No. 32, is a primary burial belonging to a child. In the absence of pots it is difficult to associate this burial with any of the cultural periods at the site, but as it was found at the same level, it is probably contemporary to Burial No. 34. Due to ploughing, the skull and shoulder bones have been badly damaged. Fortunately, the trunk and lower portion of the body have been well preserved. The body has placed in a supine position with its arms and legs straight and parallel towards the south. The burial is oriented 5° in the northwest to southeast direction. Its burial pit is 1.35 m long and 45 cm wide and has survived to a depth of 10 cm. The pit is lacks any clay lining. No burial pots were found in the burial pit. It is likely that ploughing damaged the skeleton and pots.

Burial No. 36 (Tr. CH3)

(Figures 8.123 - 8.125)

At a distance of 1.65 m west of Burial No. 34 and 1.35 m south of the northern trench line (CH3) is Burial No. 36. This primary burial belongs to a fully-grown adult. Ploughing has damaged portions of the skeleton's lower legs and the part above the clavicles. Only the trunk of the skeleton and parts of its humerus were found. The burial is oriented 15° in the northwest to southeast direction. As the burial is very close to the surface and badly damaged, its entire length was not excavated. The length of the visible burial pit was 1.16 m and its width was 60 cm. The pit has only survived to a depth of 4 cm.

The body was placed in a supine position in an attention position with its hands and legs parallel to the southern side. Both palms were placed straight and parallel to the proximal femurs. The pelvic bone, vertebrae and rib bones have been preserved. The left hand was completely preserved, but the right arm, particularly humerus and radius-ulna, were damaged. No burial pots were found. It is quite likely that they were removed in the process of ploughing. The person appears to have been robust and healthy.

Burial No. 41 (Tr. CH4)

(Figures 8.126 - 8.128)

Burial No. 41 is located immediately to the east of Burial No. 40 and 70 cm to the west of Burial No. 44. This primary burial was oriented in the north to south direction and probably belonged to a female child. Its pit is located 2 m to the north of the southern trench line (CH4). The burial pit is 1.80 m long and 52 cm wide. It has survived to a depth of 10 cm. The skeleton inside was placed in an extended supine position with legs and hands straight. The head, which is on the north, was probably placed on a higher level. Because

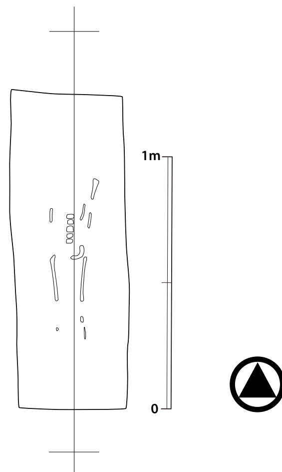


Figure 8.122 Plan of Burial no.35 (1:30)

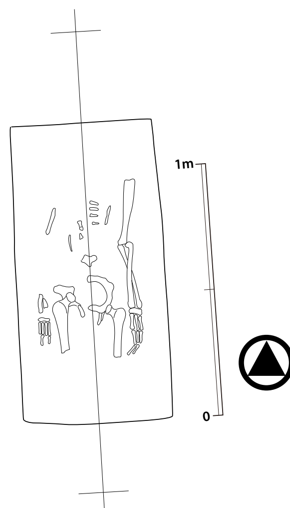


Figure 8.123 Plan of Burial no.36 (1:30)

of this position, the chin was found pointed towards the thoracic vertebrae. All the parts of the skeleton were found in a good state of preservation except parts of the left radius and ulna. The total height of the skeleton is 1.10 m. The feet of the person were turned slightly towards the east. The skeleton was found almost at the centre of the pit. In the right hand was found a copper bangle, and one jasper bead near its right clavicle bone suggest that the deceased was buried with a necklace. Even though is the bead was found close to the ploughing zone it has not been damaged.

To the north of the head were found seven pots arranged in a row running from east to west. Most of the pots belong to a local variety. Pot No. 1 is a small lota, with a globular body, flat base, concave neck and an everted rim. It has tilted towards the east. This seems to be a local imitation of a Harappan goblet. To its west is a miniature beaker that has typical Harappan characteristics, including a cylindrical body, slightly bulging base, and a featureless vertical rim. It is 9.5 cm in height and the rim diameter is 5 cm. It has fallen towards the northeast. Pot No. 3, which was found to the west of Pot No. 2 near the western section, is probably a shallow saucer that has broken into many pieces. As such, its dimensions and shape cannot be determined. Pot No. 4, which is to the south of Pot No. 3, is globular with a flat base, concave neck, and short out-turned rim. It is 16 cm in height and its mouth's diameter is 9 cm. To its southeast is a miniature lota with a round body and slightly flared featureless rim. As the majority of this pot underlies



Figure 8.124 Burial no.35



Figure 8.125 Burial no.36

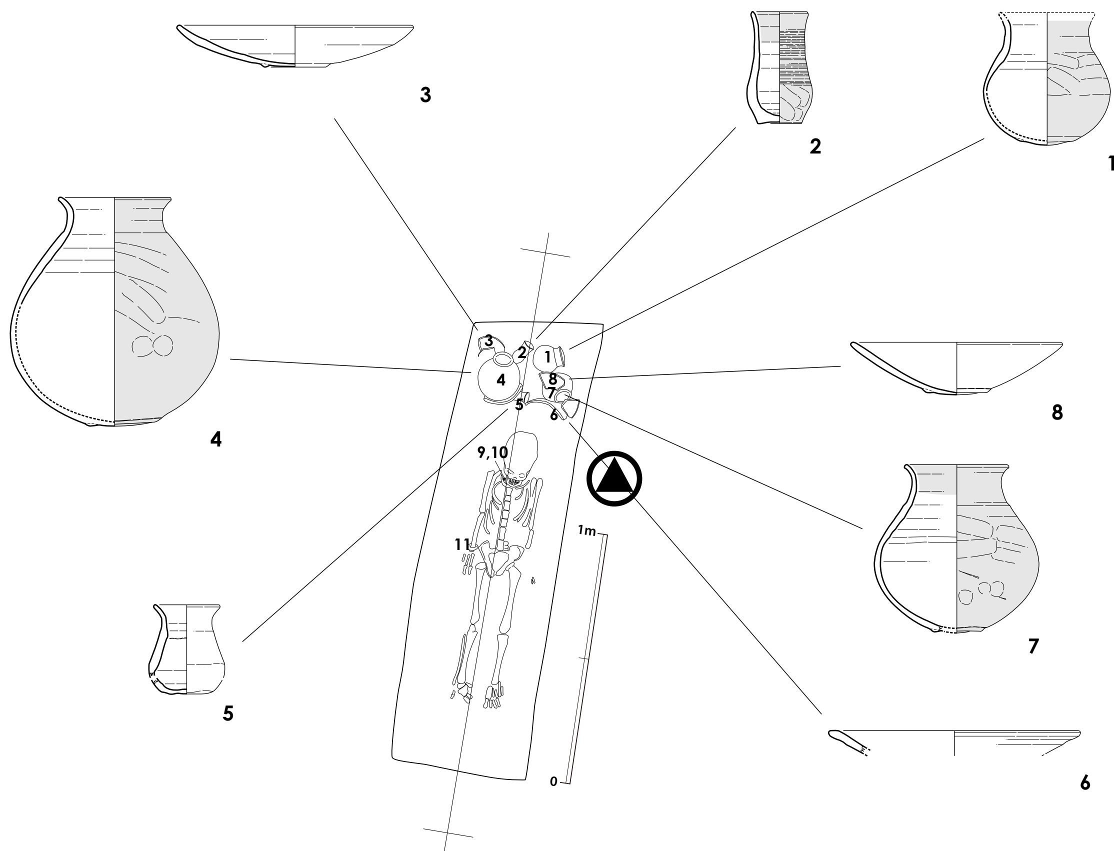


Figure 8.126 Plan of Burial no.41 (1:30)

Pot No. 6, its height could not be measured. The diameter of its mouth is 5 cm. Pot No. 6 is a concave-sided bowl, which has broken into two halves. One half is to the east of Pot No. 5, having fallen vertical. The other half is to the west of Pot No. 5 and below Pot No. 4. Pot No. 7 to the south of Pot No. 1. It is similar to Pot No. 1, but slightly bigger. The diameter of its mouth is 9 cm and its height is 12 cm.

Considering the presence of ornaments and seven pots, the position of the deceased must have been somewhat high. This burial belongs to Burial Phase III of the Late Mature Harappan Period.

Burial No. 53 (Trench CF4)

(Figures 8.75 - 8.79)

This burial is located 60 cm to the east of Burial No. 51 and 3.25 cm to the south of the northern section of the trench (CF4). This primary burial belongs to the Late Mature Harappan Period (Burial Phase III). It is oriented 20° in the northwest to southeast direction and has been partially cut along the western margin by a late burial (Burial No. 54). The burial pit is 2.50 m long and 75 cm wide and has survived to minimum depth of 25 cm. It is lined with a layer of clay plater that is 20 cm thick. The burial pit is slightly higher towards the southern side, where its depth is 15 cm. It gradually slopes towards the northern sides.

It contains the complete skeleton of a probable fully-grown male. It was placed an extended supine position with its head towards the south. Originally, both the legs were placed straight and parallel to each other but the right tibia has shifted towards the east and is now lying close to the left tibia. The phalanges of the leg have not shifted at all. All the bones are visible except for a few ribs and part of the cervical vertebra. The total length of the person is 1.63 m. The head is tilted to the east. All the upper teeth are visible, but the mandible is missing from the skeleton. The radius and ulna of both hands are not there. It is quite likely that rodents have destroyed some of these bones as there are rodent holes just below the skeletal



Figure 8.127 General view of Burial no.41, from south



Figure 8.128 Details of Burial no.41

material. The femora of the body are also placed parallel to the south.

To the north of the head were placed ten pots arranged in two rows running from east to west. All but Pot No. 2, which is a dish on stand, appear to be of regional varietes. Pot No. 1 is a small lota with a globular body, flat narrow base and a short everted rim. It is 10 cm in height with a mouth diameter of 7 cm. The lota has fallen to the south. To its west is a dish-on-stand with a hollow flaring base and a step-sided dish on top. The base has a round featureless rim. The total height of the dish on stand is 34 cm and the diameter of both the base and dish is 34 cm. In the centre of the dish are concentric circles. It was found standing vertical in situ. Pot No. 3 is a globular vase. It has broken shoulders and a round body. It probably had a flat base, which is not visible. It has an everted rim. It is 13 cm in length with a mouth diameter of 10 cm. It has tilted to the south. Pot No. 4 is a similar to Pot No. 3 in terms of shape and size. The rim of this pot is damaged. It has tilted to the north. Pot No. 5, which stands vertical, appears to be a miniature lota, the lower half of which is still embedded in the ground. It is to east of Pot No. 4. To the south of Pot No. 4 lies Pot No. 6, which is similar to Pot No. 3 but smaller in size. It has a prominent everted rim with a diameter of 7 cm. As the lower half is still embedded, its height could not be measured. The pot has tilted slightly towards the north. Pot No. 7, to the west of Pot Nos. 6 and 8, has fallen flat to the south along the western margin of the pit. It is a large pot with a spherical body that tapers towards the mouth and base. It has an insignificant ring base and probably had prominent everted rim (this has been damaged). The pot is 27 cm in height and as the mouth is still embedded, its diameter cannot be measured. To its southeast is Pot No. 8, which resembles a Harappan 'S' shaped jar. It has flat base and everted rim. It is 21 cm in height and the diameter of the mouth is 10 cm. This pot has fallen to the northeast. Below the rim portion of Pot No. 8 lies Pot No. 9, which is a wide mouthed, shallow convex-sided bowl. Its mouth's diameter is 9 cm. Its height cannot be measured as its lower half is still embedded in the ground. It has slightly tilted to the south. Pot No. 10, which is to the south of Pot No. 2, is a globular pot with a squat bulging body, flat narrow base, concave narrow mouth, and short out-turned rim. It is 18 cm in height and has a mouth diameter of 13 cm. It has tilted slightly to the south. Based on the basin, clay lined pit, and larger number of pots, this burial must have belonged to a person of slightly higher status.

Burial No. 62 (Tr. CD4)

(Figures 8.129 - 8.133)

This burial is located in the northwest corner of Trench CD4, 35 cm to the west of the eastern section and 40 cm to the south of the northern section of the trench. This primary burial, which is oriented from north to south, belongs to the Late Mature Harappan Period (Burial Phase III). The burial pit is 2.20 m long and 65 cm broad and has survived to a depth of 35 cm. It has a 20 cm thick clay lining.

Inside the burial pit is a skeleton of a sub-adult, probably male, placed in a supine position. Both the legs and the left arm, which is complete, are positioned straight in an attention position. The lower extremities, parts of the right ribs, and right hand are missing. The skull has detached from the body and was found lying in north to south orientation facing north. The jaw is 10 cm to the east of the skull, also oriented from north to south. It appears that the dislocation of the head took place before it was ceremonially buried, as it was placed 8 cm higher that the lower body, probably on a small clay stand. The human remains measure 1.06 m from the cervical vertebrae to the end of the tibias. The right tibia was placed slightly to the east whereas the left one is straight.

To the north of the skull at a distance of 25 cm are eight burial pots arranged in two rows oriented from east to west. The northern line consists of small pots, and the southern line consists of bigger pots. Pot No. 1 is a pear-shaped Harappan goblet with a

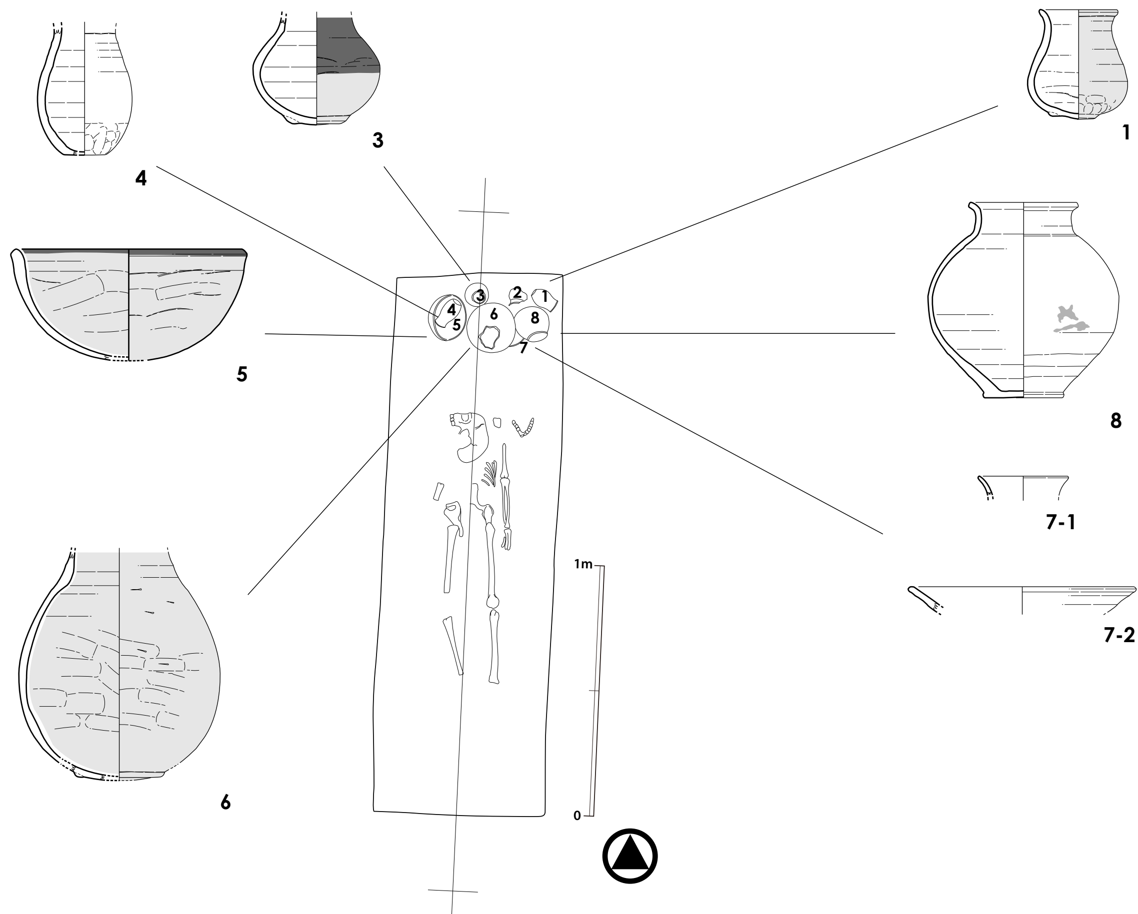


Figure 8.129 Plan of Burial no.62 (1:30)

flat base and wide, slightly flaring mouth. It is 9 cm in height and the diameter of its mouth is 6 cm. It has fallen to the east. To its west lies Pot No. 2, which is a small globular pot with a round body, the base of which is not visible. It has a predominantly everted rim. As its major portion is still embedded in the pit, the diameter of the rim cannot be measured. It has fallen to the south. To its west at a distance of 7 cm lies Pot No. 3, which is exactly the same as Pot No. 2. It stands vertical but its rim is broken and its lower portion is still embedded. Its shape and dimensions cannot be given at this time. Immediately to its west is an elongated Harappan goblet (Pot No. 4) with a flat base and slightly flared mouth. It is 12 cm in length and its mouth's diameter is 6 cm. The goblet has fallen slightly to the southeast. To the south of Pot No. 4 lies Pot No. 5, which is a deep convex-sided bowl with a featureless rounded rim. Its mouth's diameter is 8.5 cm and it is 10 cm deep. It has slightly inclined to the northeast and Pot No. 4 has fallen into it. Pot No. 6 is a medium-sized globular pot located to the east of Pot No. 5. It has a perfectly round body and a narrow mouth. Its rim is broken and therefore its shape and the diameter cannot be determined. Its lower portion has not been exposed, and its height cannot be measured. It has slightly tilted to the south. Pot No. 7 is below Pot No. 6, only a small fragment of which is visible. It appears to be a lid with a convex profile. Pot No. 8, to the east of Pot No. 6, is a globular pot. It is slightly smaller than Pot No. 6 with a perfectly rounded body and a short vertical neck with an everted rim. It is 14 cm in height and its mouth's diameter is 9 cm. It is tilted towards the south. Pot Nos. 1, 4 and 8 belong to a Harappan fabric whereas the remaining pots belong to regional fabrics.

The presence of a clay lining and the large number of pots kept in the burial are indicative the better socio-economic status of the deceased.



Figure 8.130 General view of Burial no.62, from south



Figure 8.131 Details of Burial no.62



Figure 8.132 Details of Burial no.62



Figure 8.133 Details of Burial no.62

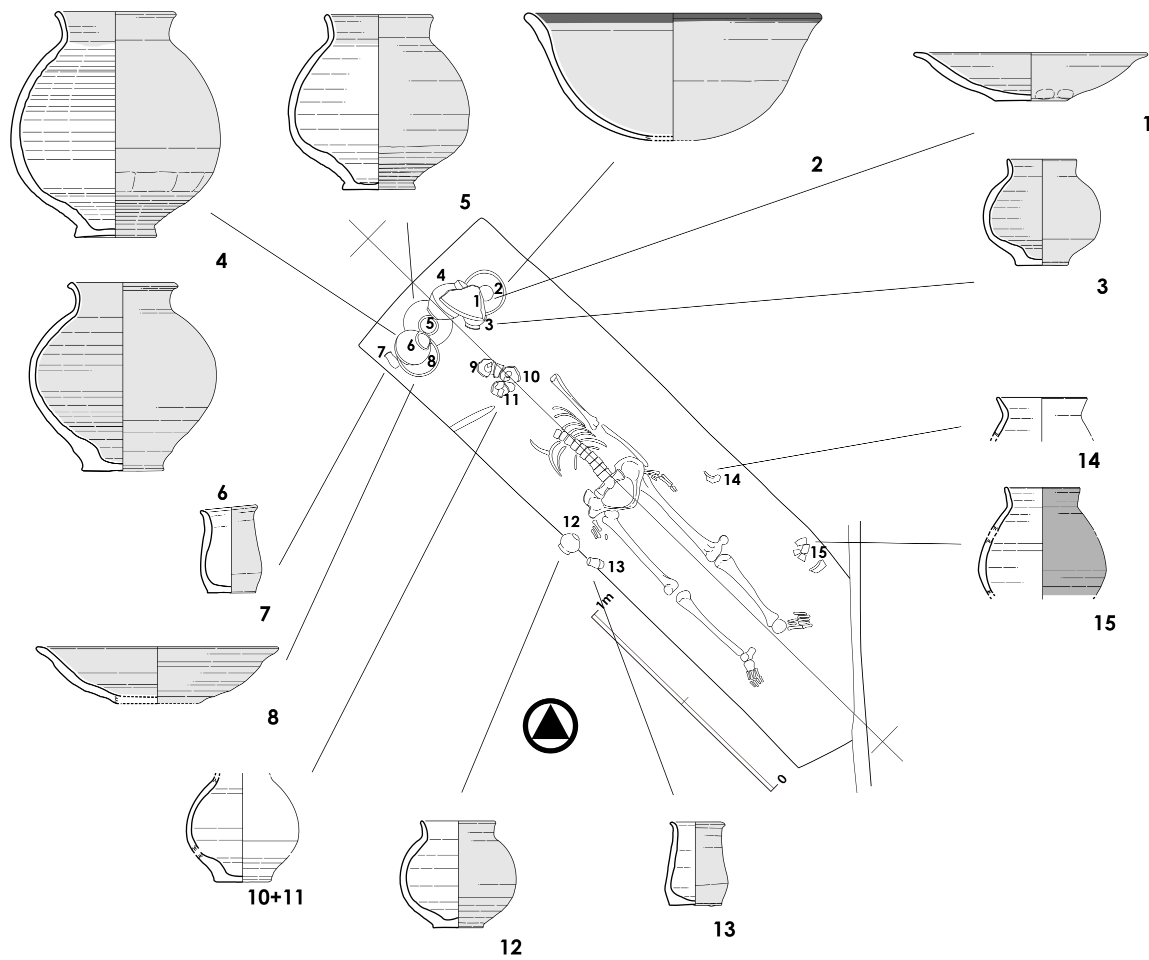


Figure 8.134 Plan of Burial no.64 (1:30)

Burial No. 64 (Trs. CD4 and CC4)

(Figures 8.134 - 8.138)

Except for southeast corner, which falls is the unexcavated Trench No. CC4, all of Burial No. 64 lies in CD4 near the southeast peg of the trench. The burial is oriented 40° in the northwest to southeast direction. Its burial pit is 2.45 m in length and 68 cm in width and has survived to a maximum depth 44 cm. It is lined with a 20 cm thick layer of clay plaster. The pit is perfectly rectangular. This primary burial belongs to the Late Mature Harappan Period (Burial Phase III).

The body was placed in a supine position with both legs and hands in an attention position. The tarsals of the legs are turned in opposite directions. The head, right shoulder, a few right ribs, and right hand (except phalanges) are missing. From the shoulder bone, the skeletal remains are 1.45 m long. The palms of both the hands are placed near the acetabulum on each respective side, both pointing south. The pelvic region and long bones indicate that the skeletal remains belonged to a fully-grown adult. The absence of the skull and cervical bones leads one to presume that the body was buried without head. Future examination it will determine whether the head was cut or fell off naturally due to decomposition.

In all, 15 pots were placed inside the burial pit. Pot No. 1 is in the northern section, 10 cm below the surface. Pot Nos. 2 to 8 are arranged in an east to west row along the northern section. Pot Nos. 9 to 11 are 15 cm to the south of the row formed by Pot Nos. 2-8. Pot Nos. 12 and 13 are in the western section of the burial pit, 5 cm to the west of the skeleton's right palm. To the east of left palm is one (Pot No. 14) pot and to the east of lower part of tibia lies Pot No. 15. This is the only burial in which pots were scattered throughout the pit.



Figure 8.135 General view of Burial no.64, from southeast



Figure 8.136 Details of Burial no.64



Figure 8.137 Details of Burial no.64



Figure 8.138 Details of Burial no.64

Pot No. 1 is a part of a large, wide-mouthed, convex-sided bowl. It is hanging in the section of the pit, inclined towards the south. It has a slightly flared mouth, the diameter of which is 20 cm. It is 13 cm deep. Pot No. 2 is a concave lid with a flat, round knob and a diameter of 20 cm. It has slightly tilted to the south. Pot No. 3, located to the southeast of Pot No. 2, is a small lota with a round bulbous body and short, vertical featureless rim. It is 8 cm in height and its mouth's diameter is 6.5 cm. It has fallen towards the southeast side. To its north is Pot No. 4, which is a globular pot of medium size with a disc base, concave neck and short out-turned rim. It is 17 cm in height and its mouth's diameter is 10 cm. It has fallen to the east. Pot No. 5 is similar to Pot No. 3 but bigger in size. It is located to the west of Pot No. 4. It is 13 cm in height with a mouth diameter of 9 cm. It stands vertical. Pot No. 6 is similar to Pot No. 5 but has a slightly everted rim and perfectly round body with a flat, narrow base. It is 15 cm tall and its mouth's diameter is 9 cm. It has tilted slightly towards the southeast side. To its west is a miniature Harappan beaker which has a cylindrical body and slightly flared mouth. Its details are not visible as it is still embedded in the ground. It has fallen towards the northern side. Pot No. 8 is a wide-mouthed, shallow, convex bowl with a slightly flared mouth and out-turned rim. It is below Pot No. 6. This bowl has a diameter of 19 cm. Pot Nos. 9, 10, and 11 were placed in a triangular fashion. Pot No. 9 is to the north, 10 to the east and 11 to the west. These pots are survived only by their bases. All the vases are possibly Harappan Goblets of same size. They appear to have flat, narrow bases. No other details can be determined. Pot No. 12 is possibly a typical Harappan Goblet with flat, narrow base and a round body. It has fallen to the west and only its lower half is visible in the pit. Pot No. 13 is a small Harappan beaker to the south of Pot No. 12. It has sloping sides, a slightly bulging lower portion and a flat base. It is 6.5 cm in length. It has fallen to the northwest and a major portion of the rim and its lower portion was not initially excavated. It has a small, round rim. Pot No. 14, which consists only of a few potsherds, appears to be a goblet with an everted rim. Pot No. 15 appears to be a similar goblet that is slightly bigger in size.

The person appears to have held an important socio-economic position, as evident from the clay lining of the burial pit and large number of pots. The skeleton probably belongs to a fully-grown male who was robust and healthy. The majority of the pots, excepting Pot Nos. 7, 12 and 13, appear to belong to a regional variety.

Burial No. 65 (Tr. CF2)

(Figures 8.139 - 8.145)

This burial is located 1.85 m to the north of southern trench line (CF2) and 1 m to the west of the eastern trench line. This primary burial belongs to the Late Harappan Period (Burial Phase III). It is one of the rare burials at the site that are oriented differently from most of the other burials. It is oriented 15° in the northeast to southwest direction. The burial pit is 3.05 m long and its width varies from 95 cm broad towards the southern end to 1.07 m towards the northern end. The pit has survived to a depth of 50 cm.

The body inside the pit was placed in a supine position facing upward. It is 1.70 m in length, with legs and arms parallel in an attention position. A few bones, such as the cervical vertebrae, right radius–ulna, both palms, and the fibulae of both the legs are absent or damaged. The lower jaw was found to the west of right pelvic bone. It lies in the north to south direction. The right tibia is displaced, lying in the east to west direction accross the tarsal bones of both legs. The lower extremities of the body were placed pointing towards the south. The head of the dead body is slightly tilted to the east.

Some pieces of jewellery were found on the skeleton. At the elbow was a big shell bangle, part of which has survived. Immediately to the west, near the last rib-bone are 3 carnelian beads arranged in a row running from the northeast to the southwest. They are long barrel-shaped, and truncated.

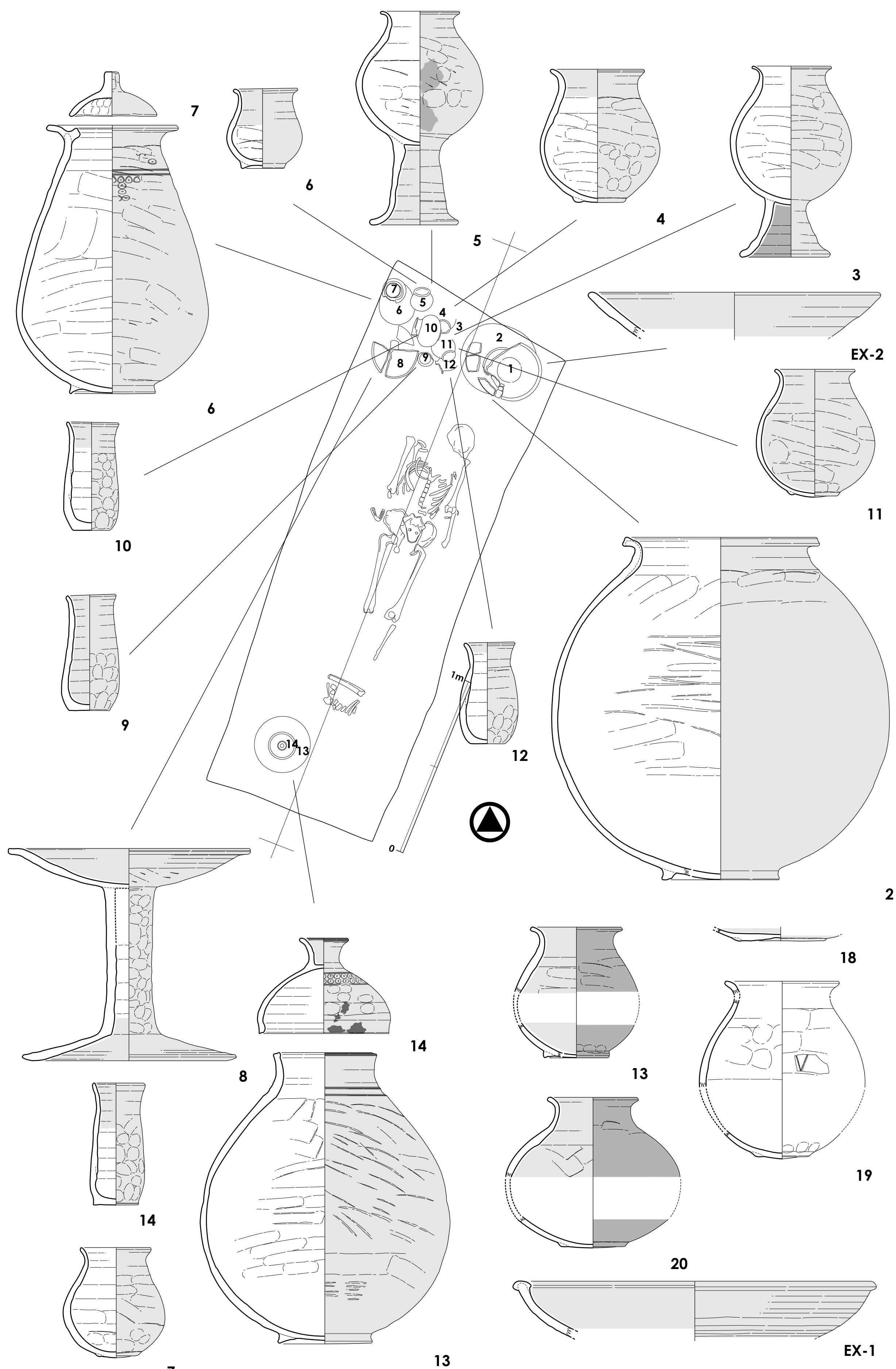


Figure 8.139 Plan of Burial no.65 (1:30)



Figure 8.140 General view of Burial no.65, from southwest



Figure 8.141 Details of Burial no.65



Figure 8.142 Details of Burial no.65



Figure 8.143 Details of Burial no.65



Figure 8.144 Details of Burial no.65



Figure 8.145 Details of Burial no.65

In all, 14 pots were found buried along with the body. 12 of these were positioned north of the head of a distance of 20 cm in a row running from east to west. Pot Nos. 13 and 14 are 20 cm to the southwest of the phalanges. Pot No. 1 is a large, shallow basin-shaped lid placed over the mouth of a large globular pot (Pot No. 2). This lid, which was placed upside down, has a diameter of 33 cm. It is deep in its centre and flared at the sides. It has a round, featureless rim. Pot No. 2 is a large globular vessel with a concave neck, short out-turned rim with a possible flat narrow base, which was not visible at the time of recording. It is located to the east of the pit wall and stood almost vertical in its original position. As it is covered with a lid (Pot No. 1) the exact diameter of the mouth of the pot could not be measured. As the base was still embedded in the ground, its exact height cannot be reported. Pot No. 3, located to the west of Pot No. 2, is a small globular pot with a short out-turned rim. Its mouth's diameter is 9 cm and it is 13 cm in height. It has tilted slightly to the south. It has also inclined towards south, whereas Pot No. 5 has inclined towards the northwest. Pot No. 4 is located to the northwest of Pot Nos. 3 and 5. Located to the west of Pot No. 4 are globular pots similar to Pot No. 3 in shape and size. To the west of Pot No. 5 is a Harappan 'S' shaped jar. It has a long body, flat mouth with a broad groove on top, and an everted rim. Its mouth's diameter is 15 cm. As the lower portion is was not visible its exact height cannot be reported at this stage. It stands almost vertically. On top of this pot is a very small lid which was placed upside down (Pot No. 7). It is a very shallow convex-sided pot with a featureless rim. Its diameter is 9.5 cm. Pot No. 8, located to the south of Pot No. 6, is a dish-on-stand that has inclined towards the south. The lower portion of the stand was not visible but it appears that it has a flared base. The stand is thus tubular in shape. It is 17 cm long. On top is a small dish, which is slightly deep in its centre and with sides that flare and the start to incipiently droop. This is an element of the Late Mature Harappan Period. The diameter of the dish on top is 30 cm. To its east are Pot Nos. 9 and 12, which are small globular pots that slightly taper towards the mouth and having a rested rim. Both appear to be of the same size and shape, but the details of their shapes and dimensions cannot be given as they were not fully visible. Pot No. 9 has inclined towards the southeast, Pot No. 12, which is to the east of Pot No. 9, has fallen to the southwest. Pot No. 10 is a globular pot with a squat bulging body, ring base, narrow mouth and short out-turned rim. It has fallen to the west. It is on top of Pot Nos. 3 and 11. Pot No. 11, which is on top of Pot No. 12, has slightly inclined towards the southeast, which is to the south of Pot No. 3.

In terms of shape and size, Pot No. 11 resembles Pot Nos. 3 and 5. Pot No. 12, which was placed to the southwest of the leg bones, is a large globular pot. Its lower half is embedded in the ground and its rim portion covered with a lid, which is Pot No. 14. Pot No. 14 has a 3 cm hollow knob and has a diameter of 5.5 cm. Its upper part flares and has a featureless but rounded rim. Its lower resembles an upside-down convex-sided, wide-mouthed bowl with slightly incurved sides.

Considering its large pit, jewellery in the form of beads and bangles, and its large number of pots, the social status of this person seems to be quite high. This skeleton appears to have belonged to a fully-grown female who was quite healthy and robust.

Burial No. 67 (Tr. CF2 and CF1)

(Figures 8.146 - 8.150)

Most of this burial was located in the baulk of CF2 and CF1. Only its southwest corner was found in Trench CF1. It is 90 cm to the southeast of Burial No. 66. This primary burial belongs to the Late Mature Harappan Period and is oriented 25° in the northwest to southeast direction. Its burial pit is 2.50 m long, 90 cm wide and has a clay lining that is 20 cm thick. The pit was dug unevenly. It gradually slopes towards the south. The depth of the burial pit towards the north is 10 cm and towards the south it is 20 cm. The skeleton inside was placed with its legs towards the

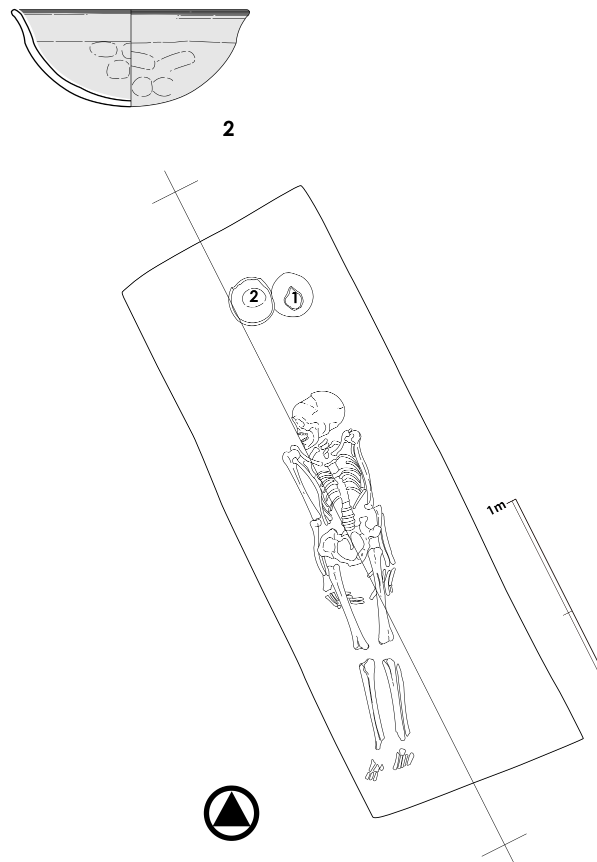


Figure 8.146 Plan of Burial no.67 (1:30)

southwest whereas its head is towards the north. This is the best-preserved burial at Farmana, and all of its bones, save for patellae are, were found intact. The body was placed in a perfect attention position with arms and legs parallel. The palms have been turned inside and placed under the thighs and the feet turned towards the west. The head of is turned to the west. Teeth, lower jaw, ribs and phalanges were all found in appropriate anatomical position and were well-preserved.

The length of the skeleton is 1.58 m. The skeleton belonged to a fully-grown male adult who was somewhat delicate compared to the other comtemporary males at Farmana. To the north of the head at a distance of 33 cm are two burial pots placed in a row running from east to west. Both the pots are of a coarse regional variety.

Pot No. 1 is a globular pot with a slightly narrow neck, everted rim and a flat base which was not visible at the time of recording. This pot had been cracked and slightly disfigured. To its west is a large and deep convex-sided bowl with slightly flaring sides and a featureless sharp rim. Because of pressure, the original shape of the bowl is disfigured and details like mouth diameter cannot be measured.

The presence of only two coarse pots indicates that the socio-economic status of the person was quite low.

Secondary Burials

In all, ten secondary burials belonging to Burial Phase III have been excavated, of which seven are oriented from north to south and the remaining three are oriented from the northwest to southeast.

Burial No. 3

(Figures 8.151 - 8.153)

Located at a distance of 70 cm to the south of Burials Nos. 1 and 2 is this secondary burial. Its burial pit, 2.55 m long and 75 cm wide, is perfectly



Figure 8.147 General view of Burial no.67, from southeast



Figure 8.148 Details of Burial no.67



Figure 8.149 Details of Burial no.67



Figure 8.150 Details of Burial no.67

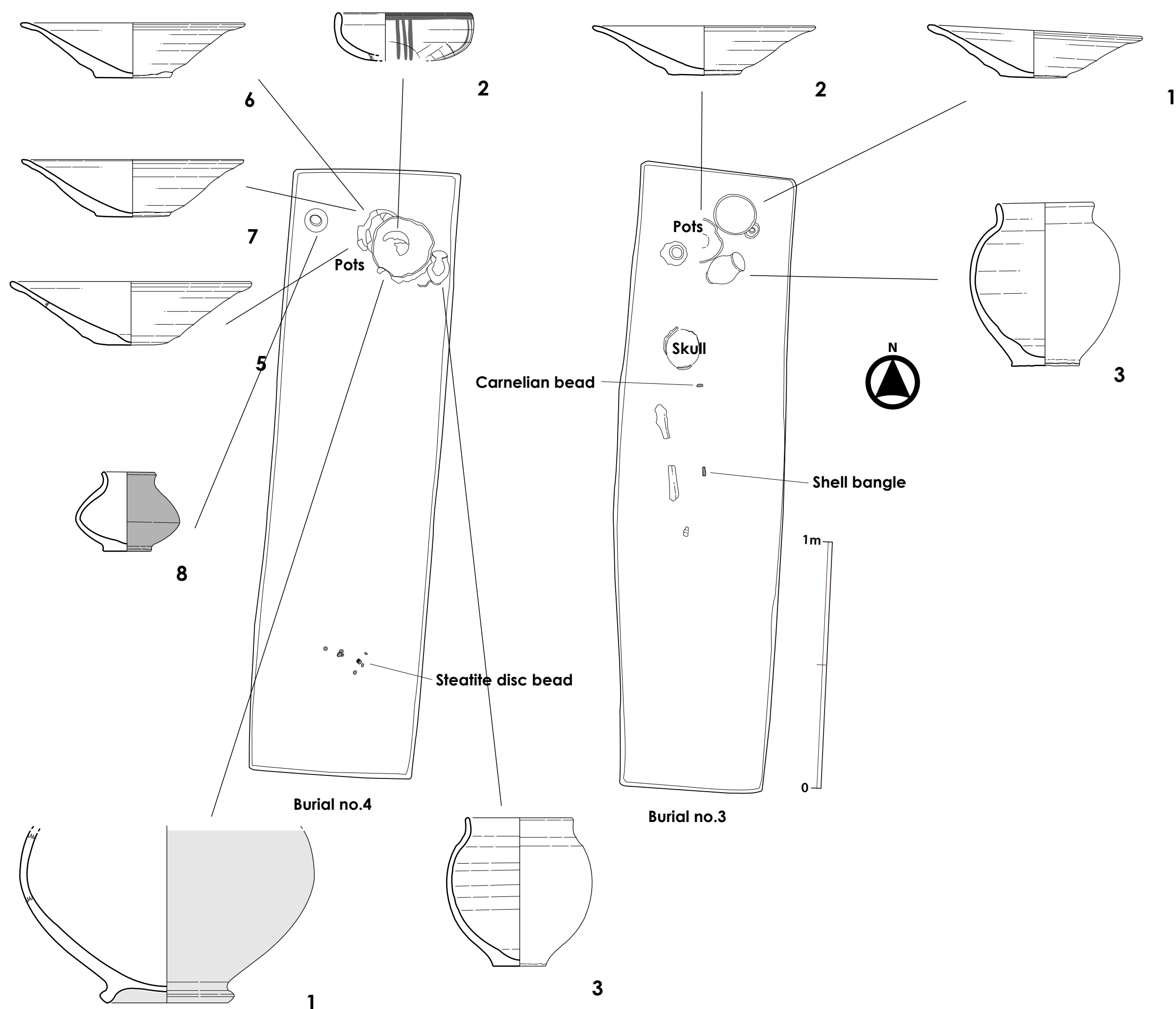


Figure 8.151 Plan of Burial nos.3 and 4 (1:30)

rectangular, oriented in the north to south direction. Due to ploughing, the burial has been badly disturbed. The skeletal remains inside the pit were placed in the northern part of the pit. They consist of a partly broken skull and few long bones . The presence of one barrel-shaped agate bead in the burial pit suggests that a necklace was among the burial goods. On the right ankle was found a shell bangle. The skeletal remains inside the pit are oriented from north to south with the head towards the north. To the north of the skull, at a distance of 20 cm, were placed possibly six pots. Three have survived. Of the three pots, two are saucers and one is a goblet of medium size with a short vertical neck, round body and disk base. It appears from the impressions of pots that in addition there were a dish-on- stand and two beakers placed inside. The pit is survived to a depth of 8 cm.

Burial No. 4

(Figures 8.151 - 8.152)

This burial was located parallel to Burial No. 3, 72 cm to its west. It is oriented in the north to south direction. The burial pit is perfectly rectangular, 2.40 m long and 70 cm wide and has survived to a depth of 6 cm. The skeletal remains inside the pit consist of a few bones belonging to the lower extremities with possibly anklets made of steatite beads, many of which were found scattered in the southern part of the pit. Towards the northern part of the pit, 20 cm to the south of the northern end, were placed seven pots, consisting of three saucers (dishes), one globular pot of medium size and one small shallow bowl, flanked



Figure 8.152 Burial nos.3 and 4 (1:20)



Figure 8.153 Carnelian bead and shell bangles from Burial no.3 (1:20)

in the middle by one goblet to the east and one small miniature globular pot on the west. The pots in the middle were placed one above the other with dishes at the base and small shallow bowl on top.

Burial No. 5

(Figures 8.154 - 8.157)

This is a fractional burial belonging to a child. It is located 1.50 m to the west of Burial No. 4. The burial pit, which is rectangular measuring 1.64 m by 47 cm, is oriented 30° from northwest to southeast. The burial pots kept inside may have been removed, as it is close to the surface and within ploughing zone, and therefore the burial appears to be devoid of any burial pots. The skeletal remains located in the north to south direction, consist of the upper half (above abdomen) of a skeleton with a skull towards the north. The left hand and some ribs on the left side are missing. The right half of the trunk is present, consisting of a complete right hand and ribs. A double copper bangle is present in the right hand on the upper part of the radius bone. The length of radius bone is 25 cm, whereas that of humerus is 14 cm. The skull is badly damaged and therefore the facial features and the teeth are not clear.

Burial No. 13 (Trs. CD3 and CE3)

(Figures 8.158 - 8.159)

This burial is located at the junction of trenches CD3 and CE3. It is 1.13 m to the south of the northern trench line. It is a highly disturbed burial, belonging to the Late Mature Harappan Period (Burial Phase III). This partial burial was ceremoniously interred in a relatively large pit oriented in the north to south direction. The burial pit measures 2.43 m in length and 1.04 m in width. Towards the northern end, the pit becomes narrow (58 cm) for a length of 36 cm. All of the pots and the human bones inside the pit have been badly disturbed by ploughing. The pit has hardly survived to depth of 6 cm. At the northern end are the possible remains of three small globular pots, the shapes of which are not clear as they are survived only in the form of potsherds. They were placed 20 cm away from the northern end of the pit. This is the only burial in which the skull was positioned towards the southern end of the pit. Only its back portion has survived. It is 60 cm to the north of the southern pit line and 40 cm to the east of the western line. Between the skull and the pots are scattered a few long bones which probably belonged to the deceased's arms.

Burial No. 15 (Trs. CE3 and CE4)

(Figures 8.160 - 8.161)

This burial is located on the junction between trenches CE3 and CE4 at the distance of 70 cm to the north of Burial No. 14. This is a secondary burial belonging to Burial Phase III of the Late Mature Harappan Period. The burial is located 100 in the northwest to southeast direction. Its pit is 2 m in length and 61cm in width. It belongs to a sub-adult.

The skeletal remains included in this burial consist of a skull with a displaced mandible, a few ribs, and parts of the left hand. These are located towards the middle of the pit, 65 cm to the north of the southern end and 20 cm to the east of the western wall of the pit. The pit survived to the depth of 20 cm. The head was placed facing west and its lower jaw was found at the distance of 8 cm towards south. Immediately to the south of the jaw are parts of the left arm and few ribs.

To the north of the head at distance of 35 cm are two pots which were included as burial offerings. Both are red ware basins and the one towards south is almost complete. It has a diameter of 23 cm and depth of 12 cm. It has beaded rim. The other basing, towards the north, is the same save for the rim, which is everted. The basin has only partially survived.

Burial No. 16 (Tr. CE3)

(Figures 8.162 - 8.163)

This is badly preserved burial probably belonged a small child. It is oriented in the north to south direction. The burial is located 1.10 m to the west of

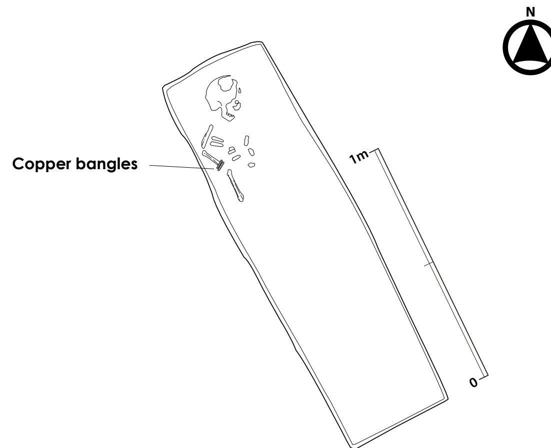


Figure 8.154 Plan of Burial no.5 (1:30)



Figure 8.155 Copper bangles from Burial no.5 (1:1)

Burial No. 40 and 2.10 m to the north of the southern trench line (CE3). It belongs to Burial Phase III of the Late Mature Harappan Period. This secondary burial includes a few fragments of long bones in the middle of the pit and a couple of convex-sided bowls as burial offerings towards its northern end. The pots belong to a red variety. The skeletal remains were found at distance of 40 cm to the south of the northern end and 20 cm to the east of the western margin of the burial pit. The shape and dimensions of the pots cannot be determined as they are badly damaged or destroyed. The burial pit is 1.35 m long and 45 cm wide. It has hardly survived, preserved to a shallow depth of 3 cm. As it lies in the ploughing zone, it was highly disturbed and some of its contents may have been lost.

Burial No. 19 (Tr. CE3 and CF3)
(Figures 8.48 - 8.49)

Located on the junction between trenches CE3 and CF3 is a secondary burial belonging to Burial Phase III of the Late Mature Harappan Period. It is 90 cm to the south of the northern peg of the trench and oriented 450 in the northwest to southeast



Figure 8.156 Burial no.5



Figure 8.157 Burial no.5

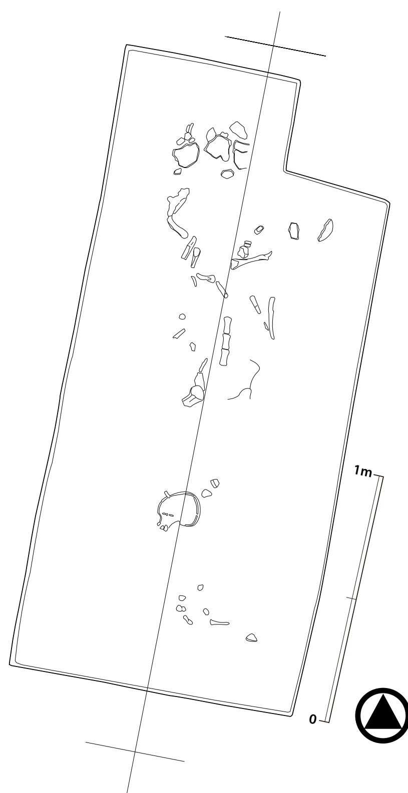


Figure 8.158 Plan of Burial no.13 (1:30)



Figure 8.159 General view of Burial no.13, from south



Figure 8.160 General view of Burial no.15, from south

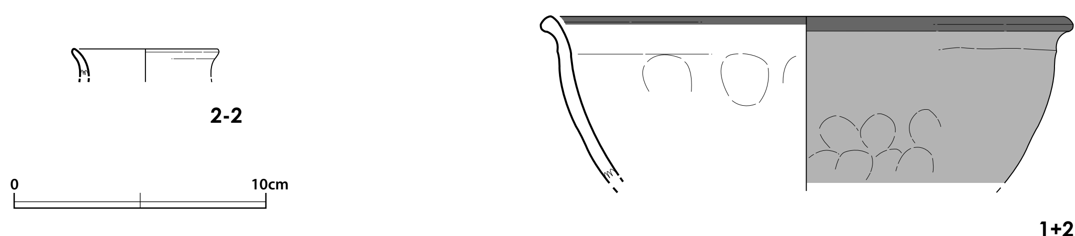


Figure 161 Pottery from Burial no.15 (1:6)

direction. Burial No. 18 cuts the southern part of Burial No. 19's pit. As such, this burial was interred slightly earlier than Burial No. 18. Its burial pit was 2.30 m long and 96 cm wide. It has survived to the depth of 20 cm. Fragments of deceased's lower jaw and a few long bones were found towards the northern part of the pit. This burial is devoid of pots or other burial offerings. It may belong to a person who's standard of living was low or who was not very well off economically.

Burial No. 25 (Tr. CE3, CF3)

(Figures 8.164 - 8.168)

This burial, belonging to Burial Phase II of the Middle Mature Harappan Period is a secondary burial. The skeletal remains consist of only two legs. It is located on the junction of Trenches CE3 and CF3, close to their northern pegs. The burial was oriented in the north to south direction. Its burial pit is 2.65 m long and its width varies from 60 cm towards the south to 90 cm towards north. It was intentionally broadened towards the northern end to accommodate a large number of pots, which were placed in lines that run from east to west. The burial pit has survived to a maximum depth of 46 cm.

The femur and tibia of both legs were placed parallel in the north to south direction. Both appear to have been 90 cm long. They belonged to a fully-

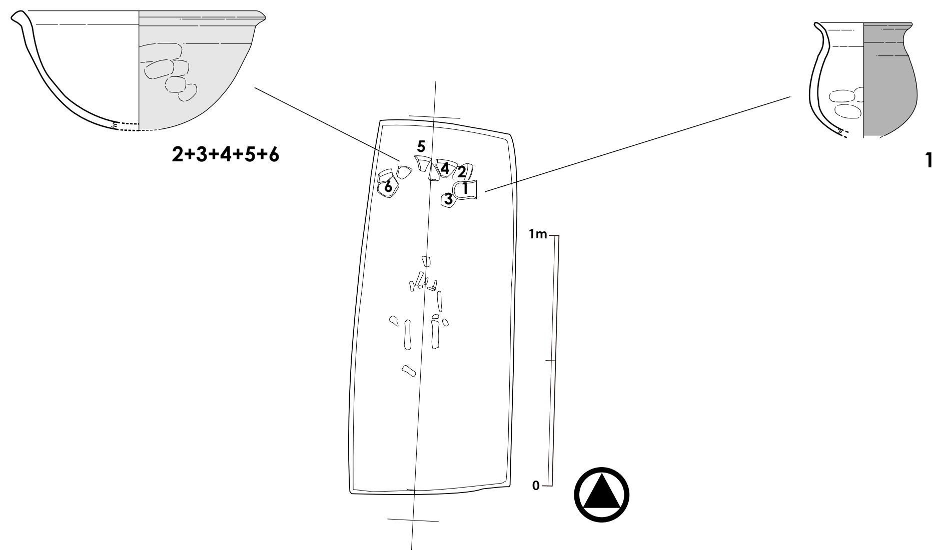


Figure 8.162 Plan of Burial no.16 (1:30)



Figure 8.163 General view of Burial no.16, from south

grown and healthy adult.

Along the northern end of the pit were found 11 pots of a fine red variety. They are all different shapes and sizes. Of these, Pot No. 1 is a pear-shaped goblet (vase) with a small vertical featureless rim and a flat narrow base. It is 15 cm in height and its mouth has a diameter of 8 cm. This pot is located to the extreme east along the section. It has inclined slightly to the south. To its north is a fragment from a similar pot, the upper part of which is broken. The pointed base portion of the goblet has survived. The goblet has inclined towards the south. At a distance of 7 cm to its north is a fragment of a small lota with a round body, slightly wide mouth, and a short out-turnned rounded rim. The dish-on-stand, which was in the centre of the pots, was quite large in size. It has now broken into many fragments spread over the area occupied by the pots. It is a typical Mature Harappan step-sided dish

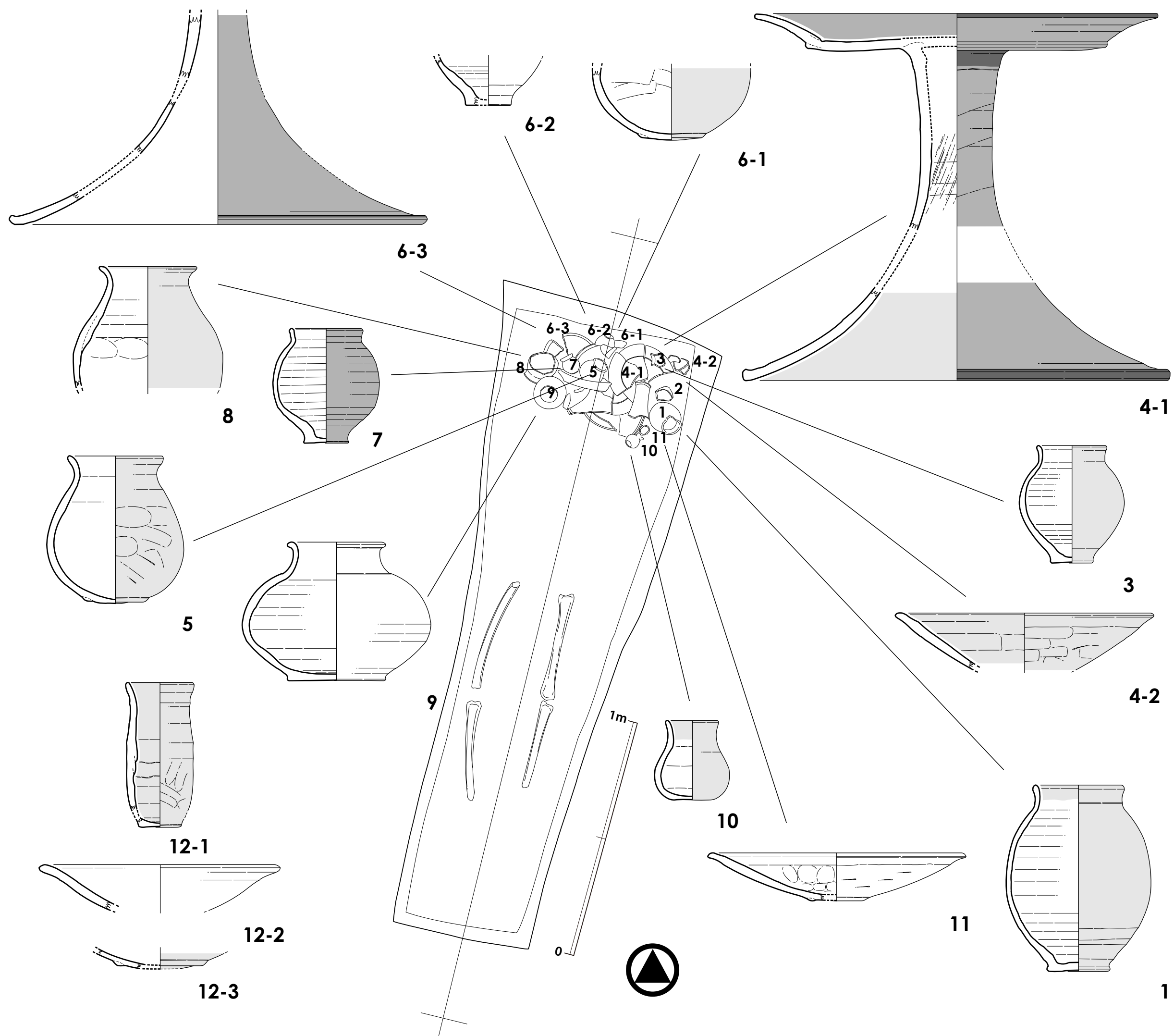


Figure 8.164 Plan of Burial no.25 (1:30)

with a long (15 cm) hollow stem and flaring bottom. On its edge is a black band. Over the fragments of the dish-on-stand lies Pot No. 5, which is a globular pot of medium size with a round bulbous body and short out-turned beaded rim. It is almost vertical in position. Its height is 10 cm and its mouth has a diameter of 8 cm. To its north is a base fragment from a broad flat-based goblet. As only the base portion has survived, its dimensions cannot be measured. It has inclined in the north to south direction with its mouth towards the south. Pot No. 7 is immediately to the west of Pot No. 5. It is a small, wide-mouthed, pointed-based goblet. Its body is perfectly round and it has a flat, narrow base. Its mouth, which is everted, has a diameter of 6.5 cm. The total height of the pot is 9.5 cm. It has inclined towards the northwest. Pot No. 8 appears to be a vase with a rounded base and a short everted rim. The diameter of the mouth of the pot could not be measured at the time of recording as part of the pot was embedded in the ground. Its height also can likewise not be measured, as its lower half is broken and missing. Pot No. 9, located immediately to the south of Pot No. 8, has fallen upside down and therefore its exact shape could not be determined. It appears to be a globular pot with squat bulging body and a flat narrow base with a diameter of 8 cm. To the south of the stem of the dish-on-stand (Pot No. 4) are two miniature pots. The one to the extreme south is a miniature vase (Pot No. 10) with a flat base and body and a wide, vertical mouth. Its 7.5 cm long and the diameter of the flat base is 4 cm. It has also fallen upside almost down. To its north is the lower portion



Figure 8.165 General view of Burial no.25, from south



Figure 8.166 Details of Burial no.25



Figure 8.167 Details of Burial no.25



Figure 8.168 Details of Burial no.25

of a miniature beaker. It is a small cylindrical pot that probably has a flat base. The diameter of its body is 5 cm.

The person to whom this burial belongs probably had a higher position in society, considering the large number of classical Harappan type pots that were included as burial offerings.

Burial No. 34 (Tr. CH3)

(Figures 8.169 - 8.170)

This burial was located close to northern edge of trench (CH3) and 40 cm to the west of Burial No. 33. Two clusters of skeletal remains were found, one towards the southern end and the other in the middle towards the north. The cluster towards the southern part of the burial pit contains a skull and few fragments from ribs and cervical vertebrae. It is oriented from north to south and belongs to Burial Phase III of the Late Mature Harappan Period.

This secondary burial is unlike other secondary burials. Its burial pit is 2.15 m long and 75 cm wide. It is perfectly rectangular and has survived to a maximum depth of 10 cm. No clay lining was found in this pit. As it is close to the plough zone it has been extensively damaged. The southern skull lies 30 cm to the west of eastern section and 32 cm to the north of the southern section of the pit. It was found facing towards the east and around it, mostly towards the western side, are few rib bones. Towards the central and northern side of the pit the bones of another skeleton were found in a second cluster, consisting of part of a skull, a few scattered rib fragments, phalanges, and hand bones. This skull also faces towards the east.

Along the northern end were found 6 pots, places in a row running from east to west. All of the pots in this burial belong to local varieties, which are coarser in nature. Pot No. 1, towards the eastern end of the pit, is a small Indian lota with round bulbous body and long vertical neck with a slightly fared rim. It is 10 cm in length and its mouth's diameter is 6 cm. It has fallen upside down. To its north is another Indian lota assigned Pot No. 2. It has a round bulbous body, slightly concave neck and an everted rim. It has a flat base and wide mouth (7 cm diameter). The pot is 10 cm in height. It has fallen towards the east. To its south, on a slightly higher level is an imitated Harappan goblet with a narrow disc base and a round body. As the upper part of the pot is damaged it is not possible to measure the height and diameter of the rim. The diameter of the disc base is 6 cm. This was found in a nearly vertical position. Pot No. 4 is a shallow wide-mouthed basin that has fallen upside down. It is located beneath Pot Nos. 3 and 5. The basin tapers towards its ring base. Other details of its shape and dimensions cannot be identified as it was hidden below overlying Pot Nos. 3 and 5. Pot No. 5 is a globular pot with a squat bulging body, short vertical beaded rim and flat base. It is 13 cm tall with a mouth diameter of 9 cm. It has tilted slightly towards the west. To its west is a concave lid that has a diameter of 20 cm. It has tilted towards the south.

Aside from these pots, on the western side of the southern skull are three bone points, located close to one another and oriented from north to south. These bone points are slightly charred, and both ends are pointed. The bone point closest to the skull is 8 cm long. The one next to it to the west is 7 cm long and the third one, which is to the northwest of Pot No. 2, is 8 cm long. These bone points seem to have been associated with the skeletal remains found at the southern side, whereas the pots found at the northern end were offered to the skeletal remains found in the central and northern portion of the pit. The presence of bone tools indicates that the deceased was either a craftsman or a hunter. The other person's socio-economic position may not have been very important, as his or her remains were associated with only local pottery types.

The general trend at Farmana is that each pit contains only one individual's skeletal remains. This is the only burial so far at Farmana that includes the fragmentary skeletal remains of two individuals at the same level. This quite likely that they were related to

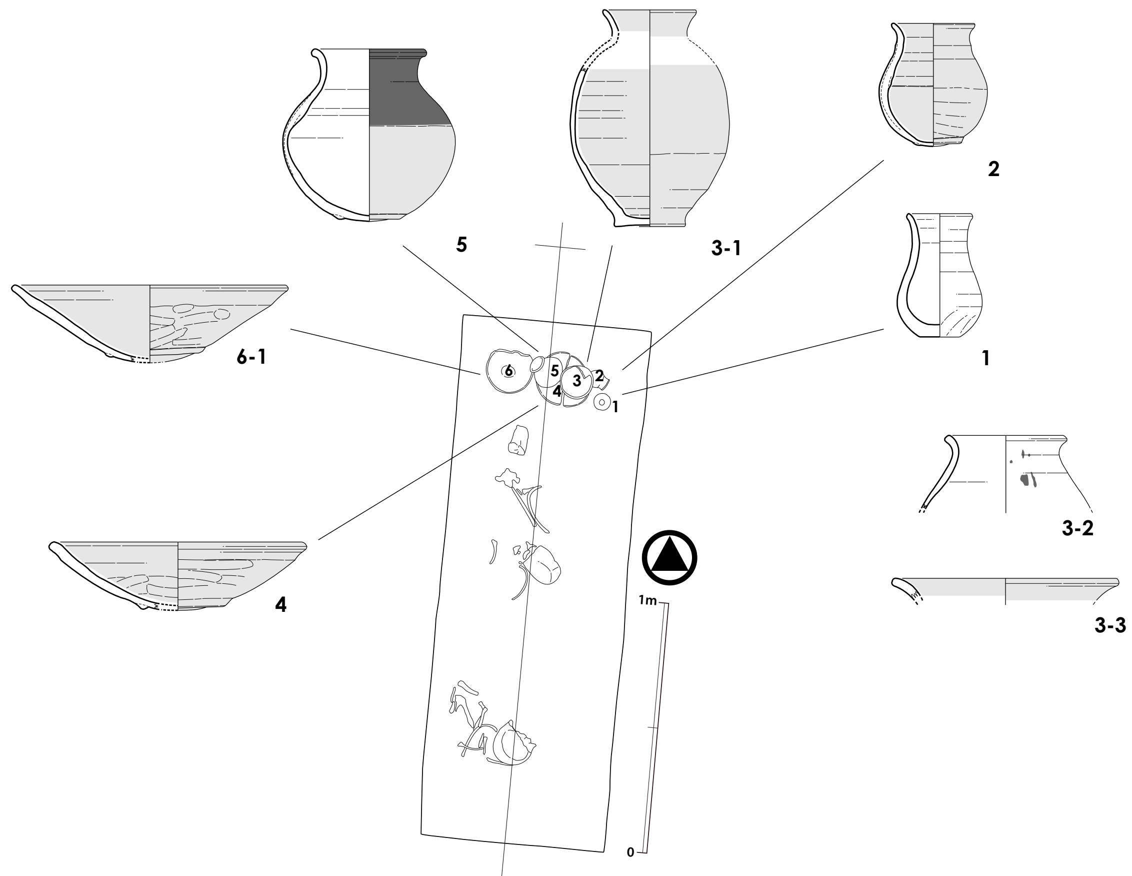


Figure 8.169 Plan of Burial no.34 (1:30)



Figure 8.170 Burial no.34

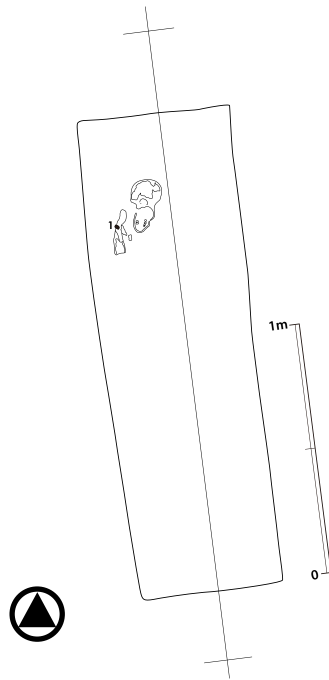


Figure 8.171 Plan of Burial no.47 (1:30)

each other and died at the same time and where hence buried in the same pit.

Burial No. 47 (Tr. CF4)

(Figures 8.171 - 8.173)

At a distance of 50 cm to the western trench line (CF4) and 1.70 m to the north of the southern trench line is Burial No. 47, which is a secondary burial. It consists only of a cranium, mandible and a few chest bones. The pit is oriented from north to south. It is 1.85 cm long and the width varies from 52 cm at the southern end to 60 cm in the northern end. The pit has survived to a maximum depth of 35 cm. In the absence of pots and other burial goods, it is difficult to assign this burial to any burial phase or cultural period. Towards the northern end were found the remains of a skull, including a mandible. The skull is located 25 cm to the south of the northern trench line and 30 cm to west of the eastern pit line. The skull has tilted slightly towards the eastern side and the mandible has detached from the cranium. The skull appears to have belonged to a fully-grown adult.

The only burial offering consists of a short cylindrical carnelian bead, which was found 7 cm to the west of the jaw. The burial pit is devoid of clay lining. The absence of clay lining along with the low number of pots inside the burial leads one to suspect that the socio-economic status of the interred individual was low.

Burial No. 52 (Trench CE4 and CE3)

(Figures 8.174 - 8.178)

On the junction between Trenches CE4 and CE3, 1.30 m to the east of the northwest peg line, was found the burial of a child. The pit is lined with a 20 cm thick layer clay plaster and is oriented 35° in the northwest to southeast direction. The burial pit is 1.45 m long and its width varies from 46 cm towards the southern end to 55 cm towards the northern end. The pit has survived to a depth of 20 cm. Based on the pottery it contained, this secondary burial can be assigned to the Late Mature Harappan Period (Burial Phase III). A few bones placed inside the pit include a skull, both the radiuses, fragments of both humeri, parts of ribs, and parts of both femora. They were found placed in the middle of the pit to the north of the southern pit line. On the lower part of both radiuses were found small copper bangles. The bones appear to have been heaped together; they were not found in any particular arrangement. The head faces



Figure 8.172 General view of Burial no.47, from south



Figure 8.173 Details of Burial no.47

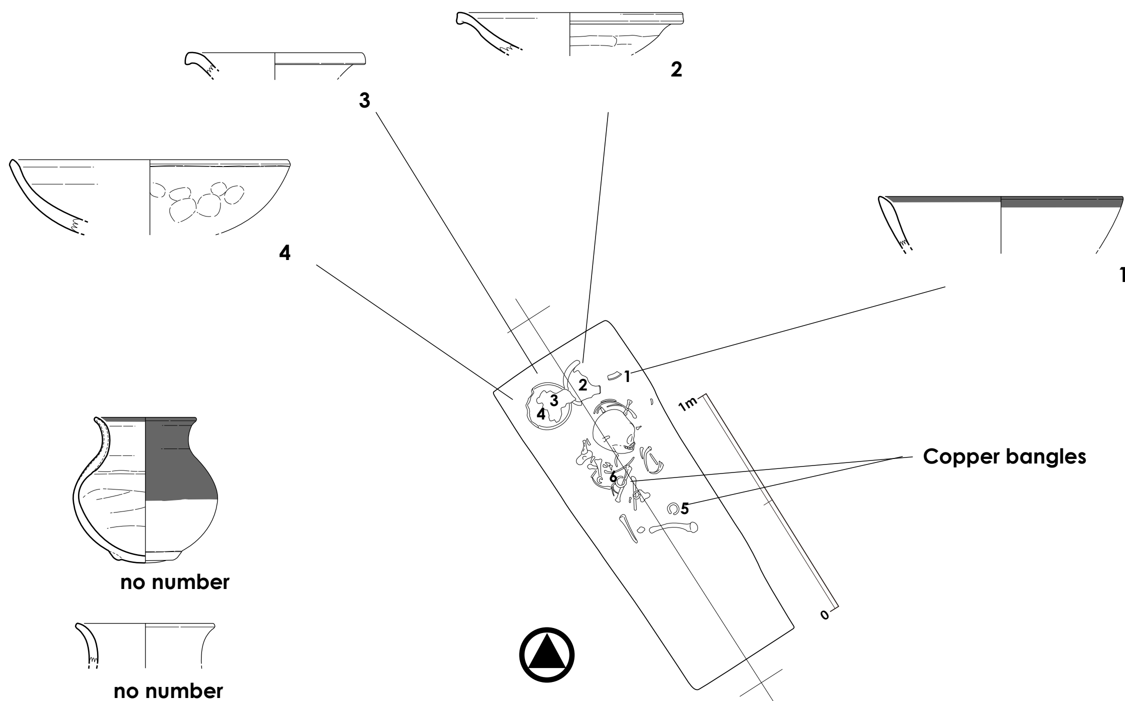


Figure 8.174 Plan of Burial no.52 (1:30)

the east.

To the north of the bones were placed three pots, arranged in a row from east to west. Pot No. 1, which is represented only by a large potsherd, appears to be a globular pot with a wide mouth and short out-turned rim. It stands vertical. To its west are Pot Nos. 2 and 3, both of which are shallow bowls of a coarse red variety. Both pots have a convex profile and are 20 cm in diameter. They were found in their original position, standing with their mouthes upwards. Considering the presence of clay lining, a couple of copper bangles, and three pots, one of which has a Harappan fabric, the socio-economic status of the child appears to have been slightly better.

Burial No. 66 (Tr. CF2)

(Figures 8.179 - 8.180)

This burial was located 1.40 m to the east of the western section and 90 cm to the northwest of Burial No. 67. This secondary burial belongs to the Late Mature Harappan Period (Burial Phase III). Its burial pit is oriented in the north to south direction. It measures 2 m in length and 60 cm in width and is very close to the ploughing surface. It has only survived to a depth of 10 cm. There is no clay lining in the pit.

Inside were found a few scattered bones, most of which are located in the northern half of the pit. In the southern half lays a small fragment of the upper part of a femur. The bones in the northern half of the pit consist of a skull, a few long arm bones, a few ribs, and other chest bones. These bones have been scattered over an area of 50 cm from east t west by 70 cm from north to south. The head and lower jaw were found laying 12 cm to the east of the eastern section and 29 cm south of the northern section. On the basis of the bones it the burial appears to belong to a fully-grown adult who was robust and healthy. As it was close to the ploughing zone, a lot of bones may have been removed and destroyed. Its offerings consists of only one small pot with a squat, bulging body, flat base, narrow neck and everted rim. It is 10 cm in height and 7 cm in diameter. The pot has tilted towards the southwest.

This is one of the poorest burials in terms of burial goods, suggesting that it belongs to an individual of low socio-economic status.



Figure 8.175 General view of Burial no.52, from southeast



Figure 8.176 Details of Burial no.52



Figure 8.177 Details of Burial no.52



Figure 8.178 Details of Burial no.52

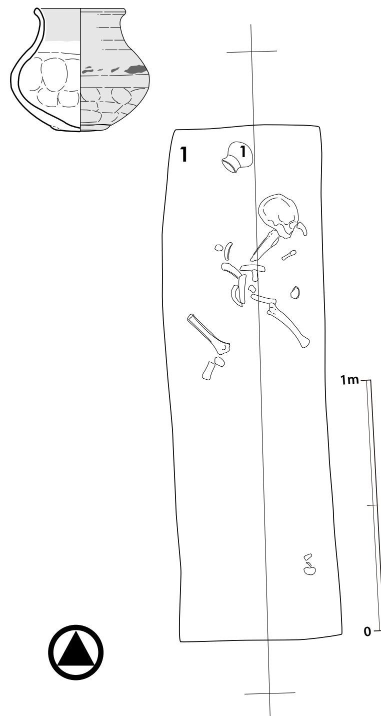


Figure 8.179 Plan of Burial no.66 (1:30)



Figure 8.180 General view of Burial no.66

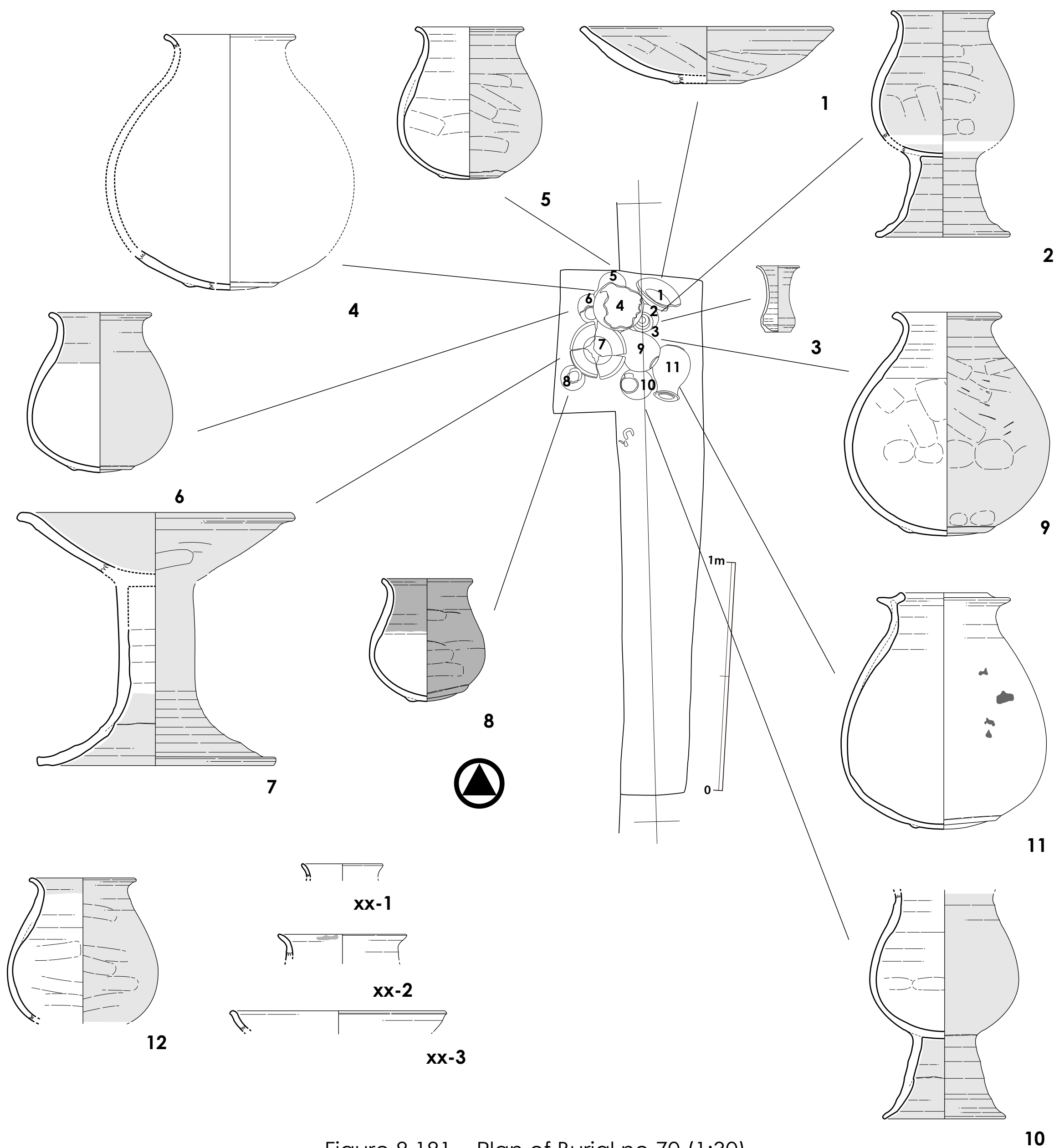


Figure 8.181 Plan of Burial no.70 (1:30)

Burial No. 70 (Tr. CG1)

(Figures 8.181 - 8.185)

This burial is located 1.75 m to the west of the eastern section and 50 cm to the south of Burial No. 68. It is a secondary burial oriented from north to south. It belongs to the Late Mature Harappan Period (Burial phase III). Its burial pit is 2.25 cm in length. The pit's average width cannot be measured as its western edge was cut when a deep channel for lifting soil was made by the farmer. The pit is 20 cm deep. It lacks any clay lining.

Its skeletal remains consist only of a couple of vertebrae located towards the northern side of the pit, 14 cm to the south of Pot No. 10 in the southernmost in the row of pots.

To the northern end of the pit were placed 11 pots of different sizes and shapes. Some of these are classical Harappan and some belong to a local variety. They were placed close to one another in an area 50 cm from north to south and 57 cm from east to west. The pots were arranged in a circular pattern. Pot No. 1 is a dome-shaped bowl with a very wide mouth bowl. It may have been used as a lid. It has diameter of 22 cm. It has slipped towards northern side, facing the northern section. It was possibly used to cover Pot No. 4. To its southwest is a globular pot with possible



Figure 8.182 General view of Burial no.70, from west



Figure 8.183 Details of Burial no.70



Figure 8.184 Details of Burial no.70



Figure 8.185 Details of Burial no.70

flat narrow base, slightly narrow mouth and everted rim. It is 13 cm in height and its mouth's diameter is 9 cm. The pot has slightly inclined to the south. Inside this pot stands a small Harappan beaker, only the mouth of which is visible. It has a cylindrical body and everted rim. The mouth's diameter is 5.5 cm. Pot No. 4 is a slightly larger globular pot, the upper part of which is sliced as it is close to the ploughing zone. It was found standing on top of Pot Nos. 2, 5 and the rim portion of a fallen elongated pot (Pot No. 9). This pot appears to be squat and globular with possibly flat base. Pot No. 5 is to the west of Pot No. 1. It is a perfectly globular pot with a slightly narrow mouth, everted rim and flat base. It is 14 cm in height and its mouth's diameter is 9 cm. The pot has inclined towards the southwest. Pot No. 6 to the southwest of Pot No. 5 is similar to Pot No. 5 but smaller in size. It is 12 cm in height with a mouth diameter of 9 cm. It has tilted slightly towards the south. Pot No. 7, south of Pot No. 6 is a small dish-on-stand. The total height of the dish-on-stand is 17 cm. It has a flared base and a deep dish with a featureless rim on top. It stands vertical in its original position. Pot No. 8 is a small globular pot with a narrow mouth, everted rim and a possible flat base. It is to the southwest of Pot No. 7. It stands perfectly vertical and is 11 cm tall. Its rim portion is damaged and its exact dimensions cannot be measured.

Pot Nos. 9 and 11 are coconut shaped with an insignificant ring base, narrow mouth and flat, internally and externally projecting rim with a large shallow groove on top. This groove was used to keep a lid. Both are 21 cm in height and with a total rim diameter of 12 cm. Pot No. 9 is located to the east of Pot No. 7 whereas Pot No. 11 is located to the east of Pot No. 10. Pot No. 10 is a globular pot with round body, sloping shoulders and everted rim. It probably has a flat base. It is located to the south of Pot No. 9 and west of Pot No. 11. It has tilted to the west. Pot Nos. 2, 3, 5 belong to typical Harappan types whereas the others belong to regional varieties. Considering the number of pots included in the burial, the status of the deceased appears to have been higher in society.

Symbolic Burials

Of the four symbolic burials excavated, three are oriented from north to south and one from northwest to southeast.

Burial No. 17 (Trs. CE2, CE3)

(Figures 8.186 - 8.187)

Located on the junction between CE2 and CE3 and 1.23 m to the east of the western peg lines is a symbolic burial perfectly oriented from north to south. This symbolic burial is devoid of any skeletal remains. It belongs to Burial Phase III of the Late Mature Harappan Period. Its burial pit is 1.52 m long and its average width 50 cm. The pit has survived to depth of 20 cm. Towards the northern end of the pit were interred seven pots as burial offerings. All except for one, which is of a chocolate slipped variety, belong to fine red variety (6). Pot No. 1, which lies almost in the middle of the pit along the northern end, is a shallow basin with a short vertical sharp rim. It was placed vertically. As it has cracked and slightly spread, its exact diameter and depth is difficult to determine. Pot No. 2 belongs to chocolate slipped variety and Pot No. 3 is of a fine red variety. They were found inside the basin (Pot No. 1). Pot No. 2 is a small lota with a squat bulbous body, flat base and everted rim. It has a rim diameter of 7 cm. It is 10 cm in height. The chocolate slipped part of Pot No. 2 is confined to upper half of the pot. The remaining outer surface is red in colour. To its north is a typical Harappan Goblet, which is pear-shaped with a ring base and a short vertical featureless rim. The diameter of its mouth is not clear but the pot is 7 cm in length. Pot No. 4 is another pear-shaped goblet with a flat bottom and everted rim. It is spherical and 24 cm long. The diameter of its narrow mouth cannot be measured as half of it has been sliced in the process of ploughing. It is located 8 cm to the east of Pot No. 2. Beneath Pot

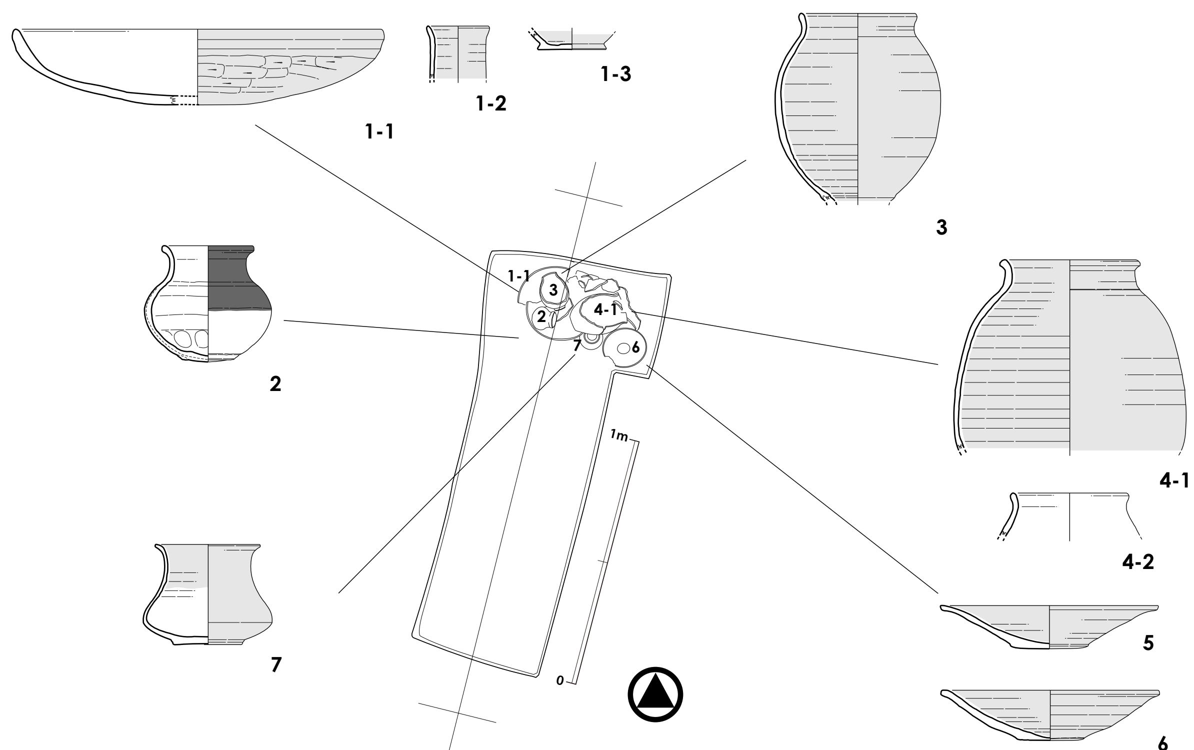


Figure 8.186 Plan of Burial no.17 (1:30)



Figure 8.187 General view of Burial no.17, from southwest

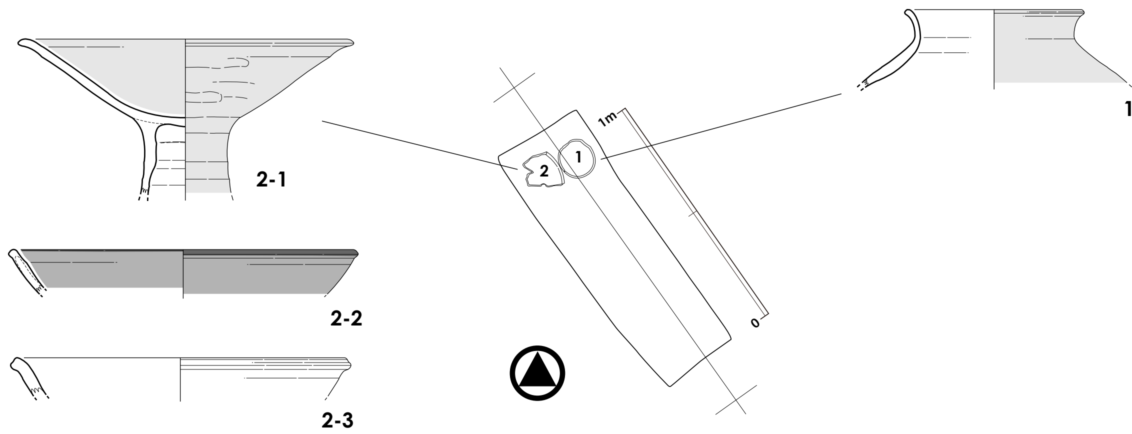


Figure 8.188 Plan of Burial no.33 (1:30)



Figure 8.189 Burial no.33

No. 4 lies one more pot, which appears to be goblet that is not well-preserved. On the southern edge of this pot is a deep saucer-shaped lid, the diameter of which is 7 cm. Immediately to the south of Pot No. 4 is a small Indian lota with a squat bulbous body, sloping shoulders and a short everted rim. It is 7 cm tall and has a mouth diameter of 9 cm. The width of the pit was broadened by 16 cm to accommodate the burial pots.

Burial No. 33 (Tr. CH3)
(Figures 8.188 - 8.189)

This burial is located close to the northern section of Trench CH3, 10 cm to the south of the northern line and 1.55 cm to the west of the eastern line of the trench. This symbolic burial consists of 2 pots placed in its northern end. This burial must have belonged to an infant, as the burial pit is small, with a length 1.15 m and width that varies from 32 cm in the southern

end to 40 cm towards the northern end. This wedge-shaped pit was oriented 40° in the northwest to southeast direction. It has survived to a depth of 20 cm, but the pots were found placed almost close to the existing surface level.

The two pots that were arranged in a row running from east to west have been badly damaged. Pot No. 1 appears to be a globular pot with possible small flat base. It is impossible to record the shape and dimensions of the base as it has been damaged. To its west is Pot No. 2, which appears to be a very shallow wide-mouthed bowl. It has round base and a featureless rounded rim. Pot No. 1 belongs to a typical Harappan fabric whereas Pot No. 2 belongs to a local fabric.

This burial belongs to Burial Phase III of the Late Mature Harappan period and its contents suggest that the interred had a low socio-economic status..

Burial No. 51 (Trench CE4)

This is one of the biggest burials at the site, located 1.80 m to the east of the western section and 2.90 m south of the northern section of the trench (CE4). The burial pit is devoid of clay lining and is oriented perfectly from north to south. It is 3.17 m long and 1.70 m wide. It has been excavated primarily in its southern portion. It is not clear whether this is a symbolic burial the level of the burial is not known. Only one large pot has been found inside and it is badly damaged. It is 50 cm to the south of the northern pit wall and 50 cm to the west of the eastern pit wall. It appears to be a red ware globular pot with a flat base. Even though the details are not yet known, the size of the pit suggests that the burial belongs to a person with a higher socio-economic status. The material recovered from this burial make it impossible to associated it with any particular cultural period or burial phase.

Burial No. 60 (trench no. CD4)

This burial is located on the baulk between CD4 and CD5. A very small portion of it extends into CD5. It is 2.64 m to the west of the eastern trench line. It is oriented from north to south and lined with thick (30 cm) clay plaster. Its pit has survived to a depth of 50 cm. The visible length of this burial in trench CD4 is 2.10 m and its average width is 70 cm. This symbolic burial lacked any skeletal remains or pottery. In the absence of pottery it cannot be assigned to any cultural period or burial phase. However, considering its thick lining, the deceased may have commanded higher social status.

6 UNEXCAVATED BURIALS

The burial pits of the following have been detected but they could not be excavated due to time constraints.

Burial No. 9 (Tr. CD3)

This burial, oriented from north to south, is located immediately to the south of Burial No. 8. It has not yet been excavated.

Burial Nos. 30 and 31

Located to the south of Burial No. 32 are Burial Nos. 30 and 31, both of which are close to the surface. They probably belong to Burial Phase III of the Late Mature Harappan Period. This is presumed on the basis of a few potsherds of the coarse local variety that were identified in Burial No. 30. Burial No. 30 is in the baulk of CG3 and CH3, extending towards south in Trench Nos. CG2 and CH2. Only a small portion (50 cm) of the burial is visible and therefore its exact length cannot be measured. It is oriented from north to south and the width of its pit is 70 cm. Its pit was lined with clay. As the burial has not been excavated its details cannot be given.

Burial No. 31 is 80 cm to the north of Burial No. 30, oriented 30° from northwest to southeast. The outline of its pit measures 1.70 m in length and 65 cm in width. It has not been excavated but a major portion of it was destroyed in the process of

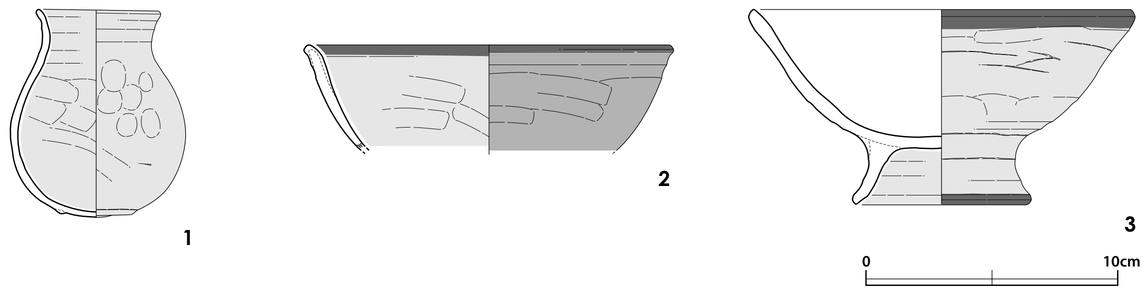


Figure 8.190 Pottery from Burial no.38 (1:6)

excavating Burial No. 32.

Burial No. 37 (Tr. CH2 and CH3)

Half of this burial lies in CH3. It is oriented from north to south and located 1.1 m west of Burial No. 11.

Burial No. 38

(Figure 8.190)

This burial lies along the western margin of CH3. It is 1.85 m to the south of the northwest corner of the trench.

Burial No. 43 (Tr. CG4)

A major portion of this burial lies in trench CG5 and CH5, which have not been excavated. This burial is oriented 45° in the northwest to southeast direction. It has not been exposed.

Burial No. 46 (Tr. CG4 and CG5)

This burial has not been excavated. Only its burial pit has been traced and it runs 25° in the northwest to southeast direction. Only the southern end of the pit is visible, as most of the pit lies in CG5.

Burial No. 57 (Trs. CD5 and CD4)

This burial is oriented from north to south and located in the baulk of CD4 and CD5, 70 cm to the east of Burial No. 56. The portion of this burial that is visible in Trench CD4 measures 66 cm in length. It is 76 cm broad. It has not been excavated.

Burial No. 59 (Trs. CD4 and CD5)

Immediately to the east of Burial No. 57 is Burial No. 59. It appears to be slightly later than Burial No. 57 and may have cut into Burial No. 57 towards its northern part. It is 40° in the northwest to southeast direction and the portion that is visible measures 1.95 m in length. Its average width is 90 cm. Though it has not been excavated, its pit appears to lack any kind of clay lining.

Burial No. 61 (Trs. CD4 and CD5)

This burial located immediately to the west of the northern end of Burial No. 62. The portion of the burial that is visible in Trench CD4 is 76 cm, and its maximum portion extends into CD5, which has not been excavated. It is oriented 10° in the northwest to southeast direction. As the burial has not been excavated its details are not known.

Burial No. 63 (Trs. CD4 and CC4)

This burial located on the baulk of these 2 trenches, 50 cm south of Burial No. 62. Only its northwest corner is visible in Trench CD4. A major portion of it lies in CC4 which has not been excavated. This burial is oriented 15° in the northwest to southeast direction and was not excavated. One typical Harappan goblet is visible on its surface.

Burial No. 69 (Tr. CG1)

This burial is located 1.10 m west of the eastern section of CG1 and 2.80 m to the north of the southern section of the trench. This burial is oriented from north to south, only the outline of which is traced. It has not been excavated.

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CHAPTER 9

POTTERY FROM THE CEMETERY AREA

by Akinori Uesugi

1 INTRODUCTION

Pottery was found in 44 burials among 56 burials which were excavated. In this section, the burial pottery is to be described. 417 specimens of pots were unearthed from these burials, all of which were subjected to detailed documentation by scale-drawings and photography by the author after the excavations. In addition to the excavated ones, 42 pots were collected by Dr. Vivek Dangi from the surface before the excavations. These pots have been also documented but they are not dealt with in this report.

At the time of excavations, the pottery was numbered in serial in each burial. The pot numbers were recorded in the plan drawing so that they can be identified with their positions in burials after excavation. Each numbered pot was placed in one cloth bag.

After the excavations in 2009, all specimens of pottery were transported to the Maharshi Dayanand University in Rohtak. Then they were washed and fixed as much as possible. However, there were a number of highly fragmented specimens which made it difficult to fix. In some specimens, only tiny fragments were identified at the time of documentation. Furthermore, in some cases, one cloth bag with a unique number was found to contain several different specimens. Therefore, at the time of documentation, the number of pottery was recounted and the specimens with no pot numbers were given new numbers. As a result of the documentation, 417 specimens were identified in the burial pottery.

2 STYLISTIC CLASSIFICATION OF POTTERY FROM THE CEMETERY

Like those from the Settlement Area, the pottery from burials can be classified into two stylistic groups based on forms, shapes and manufacturing techniques. As described in Chapter 6, the manufacturing technique is a distinctive criterion to distinguish two groups.

Technique type 1 Modelling and finishing technique using rotation on a wheel.

Technique type 2 Modelling and finishing technique using both with and without rotation.

This technique types do not show only technical differences but are associated with shapes as well. While Technique type 1 is distinctively related to the Harappan forms and shapes, Technique type 2 is dominantly associated with the Non-Harappan pottery (Figures 9.1, 9.2). Those which are called here the Non-Harappan pottery show the same set of formal and technical features as that of the Settlement Area.

Tables 9.1, 9.2 exhibits the number of burials according to the number of pots. Five burials (Burial nos. 001, 012, 032, 050A and 065) are equipped with more than 21 pots, among which Burial no. 12 yields the largest number of pots (27 pots). In 12 burials no pottery was found. The number of pots offered to the deceased may reflect the status of the deceased or may be related to the variety of contexts of burial rituals which were conducted for the deceased.



Figure 9.1 Representative specimens of the Harappan pottery



Figure 9.2 Representative specimens of the Non-Harappan pottery

Among 417 pots unearthed from the excavations, the Harappan pottery counts 241 specimens (58%) and the Non-Harappan pottery 176 specimens (42 %). In general, the Harappan pottery outnumbers the Non-Harappan pottery to some extent.

Looking at the ratio of the Harappan and Non-Harappan pottery in burials, 21 burials yield more number of the Harappan pottery while 18 burials bear more specimens of the Non-Harappan pottery. In five burials, equal numbers of the Harappan and Non-Harappan pottery are found. Among those with more specimens of the Harappan pottery, 10 burials are represented only by the Harappan pottery. For instance, Burial nos. 22 and 68 with more than 10 pots bear only the Harappan pottery. On the other hand, only six burials are represented only by the Non-Harappan pottery counting less than two pots except for Burial no. 52 with six pots of the Non-Harappan pottery.

3 HARAPPAN POTTERY

3.1 Formal classification of the Harappan pottery

(Tables 9.3)

In classifying the Harappan pottery, the ratio between H (height) and BD (body diameter) is adopted referring to the works by G.F. Dales and J.M. Kenoyer (1986) and P.C. Jenkins (1994).

Especially this classification method is used for dinstinguish Pots and Jars. Those with the ratio of less than 1.30 in H/BD index are classified as Pots whereas those with the ratio of more than 1.31 are regarded as Jars. In addition to these two forms, Beaker, Bowl, Dish, Dish-on-Stand, Bowl-on-Stand, Pot-on-Stand, Lid and Stand are distinguished (Table 9.3). The Beaker overlaps with Jar in the ratio of H/BD in some parts, those with slender bodies are classified as the Beakers.

For the measurements standards, Figure 6.1 may

Table 9.1 Number of the Harappan and Non-Harappan pottery

	Total	*Harappan*	*Non-Harappan*
B-001	23	23	0
B-002	0	0	0
B-003	3	3	0
B-004	7	6	1
B-005	0	0	0
B-006	16	15	1
B-008	6	2	4
B-010	9	3	6
B-011	4	3	1
B-012	27	8	19
B-013	0	0	0
B-014	0	0	0
B-015	2	1	1
B-016	2	0	2
B-017	9	7	2
B-018	7	7	0
B-019	0	0	0
B-020	2	2	0
B-021	0	0	0
B-022	10	10	0
B-023	9	9	0
B-024	4	2	2
B-025	16	8	8
B-026	2	1	1
B-027	11	9	2
B-028	8	8	0
B-029	8	8	0
B-032	26	21	5
B-033	1	0	1
B-034	9	1	8
B-035	0	0	0
B-036	0	0	0
B-038	3	0	3
B-039	16	10	6
B-040	12	11	1
B-041	8	1	7
B-042	0	0	0
B-044	4	4	0
B-045	0	0	0
B-047	0	0	0
B-048	10	1	9
B-049	10	9	1
B-050A	20	5	15
B-050B	5	4	1
B-052	6	0	6
B-053	10	3	7
B-054	6	3	3
B-055	0	0	0
B-056	14	2	12
B-058	0	0	0
B-062	8	2	6
B-064	13	12	1
B-065	22	2	20
B-066	1	0	1
B-067	1	0	1
B-068	12	12	0
B-070	15	3	12
Surface	42	20	22
Total	459	261	198

Table 9.2 Number of burials classified by the number of pots

No. of pots	No. of burials
0	13
1-5	13
6-10	17
11-15	6
16-20	3
21-25	3
26-	2

Table 9.3 Classification of Harappan forms

Forms	*HT/BD*	*RD*	*H*	*BD*
Pot	0.73 - 1.30	4.1 - 23.0	6.4 - 45.3	5.4 - 46.2
Jar	1.31 - 1.64	8.7 - 25.0	14.6 - 29.6	8.2 - 20.2
Bowl	-	12.2 - 38.6	-	-
Beaker	1.30 - 3.15	3.4 - 8.2	5.7 - 12.7	2.6 - 8.4
Dish	0.17 - 0.28	15.2 - 31.0	3.5 - 5.8	-
Dish-on-stand	-	24.0 - 35.0	24.7 - 38.8	-
Bowl-on-stand	-	10.4 - 25.4	17.6 - 35.5	-
Pot-on-stand	-	-	-	-
Lid	0.32 - 0.43	8.6 - 13.4	3.7 - 5.1	
Stand	0.42 - 0.52	16.7 - 20.0	7.9 - 10.3	

be referred.

3.2 Pot

(Figures 9.3 - 9.5, Tables 9.4 - 9.9)

The Harappan Pot was found in 110 specimens from 27 burials, being the commonest form in the burial pottery. They are primarily classified into the following types (Figure 9.5).

Type 1 Having elliptical, globular and oblong body shapes.

Type 2 Having carinated or ridged body shapes.

Type 3 Having a flanged neck.

[Type 1]

In total 93 specimens of Type 1 were found in burials. In classifying Type 1 into sub-types (Table 9.4), the vertical position of the (max) BD (hereafter referred as BDH) (Table 9.5) and the BH/BD (Table 9.6) index are figured out in order to see the formal variation of body shapes which vary from squat through globular to oblong shapes. The vertical position of BD is indicated by the ratio of height from the base to the position of BD to the BH (body height). The BH/BD index enables us to distinguish globular and elongated shapes of body based on the calculated figures. These indexes are combined with visual observation of shapes to reach to the final classification (Figure 9.3 - 9.5). The indexes are based only on better-preserved specimens which are subjected to measurements, but those which are fragmentary but distinguishable with their shapes by their intact portion are also included in counts.

Type 1A or those with ellliptical bodies exhibits a variation in the position of BD ranging from 0.30 to 0.52 in the BDH. The BH/BD index indicates globular to elongated shapes showing a range from 0.76 to 1.05. This indicates that some specimens of Type 1A are closer in shape either to Type 1B or 1C.

Type 1B or those with globular bodies varies from properly globular to squat globular shapes.

Those with oblong bodies are further divided into Types 1C and 1D based on the BH/BD index, i.e. Type 1C has a short oblong bodies while Type 1D exhibits elongated oblong bodies.

Those of Type 1E or the inverted elliptical shape are quite uniform in shape showing no clear formal variations.

Type 1F is distinguished from others based on their extraordinarily large sizes.

Table 9.7 shows the size distribution of theall types of Harappan Pots based on the total height. Classes 2 to 4 are dominant in number while those larger than Class 5 are very limited in number. Four specimens in Class 9 represent Type 1F which are distinctly larger than other types. In Table 9.4 and Figure 9.3, the size distribution of each type is indicated. Type 1A varies from Classes 2 to 6 though Classes 2 to 4 are dominant. Types 1B to 1D exhibit a

Table 9.4 Classification of Harappan Pot Type 1

Type	Body shapes	BDH	BH/BD	no.
Type 1A	elliptical	Class 2 - 3	Class 3 - 6	31
Type 1B	globular	Class 2 - 4	Class 1 - 5	13
Type 1C	short oblong	Class 3	Class 5	7
Type 1D	elongated oblong	Class 2 - 4	Class 6 - 7	11
Type 1E	inverted elliptical	Class 3 - 4	Class 4 - 5	14
Type 1F	globular to oblong	Class 3	Class 4 - 5	5

Table 9.5 BDH/BH distribution of the Harappan Pot Type 1

BDH/BH	Range	no.
Class 1	-0.41	1
Class 2	0.41 - 0.50	13
Class 3	0.51-0.60	43
Class 4	0.61-0.70	10

Table 9.6 BH/BD distribution of the Harappan Pot Type 1

BH/BD	Range	no.
Class 1	0.51 - 0.60	1
Class 2	0.61 - 0.70	1
Class 3	0.71 - 0.80	7
Class 4	0.81 - 0.90	27
Class 5	0.91 - 1.00	26
Class 6	1.01 - 1.10	7
Class 7	1.11 - 1.20	2

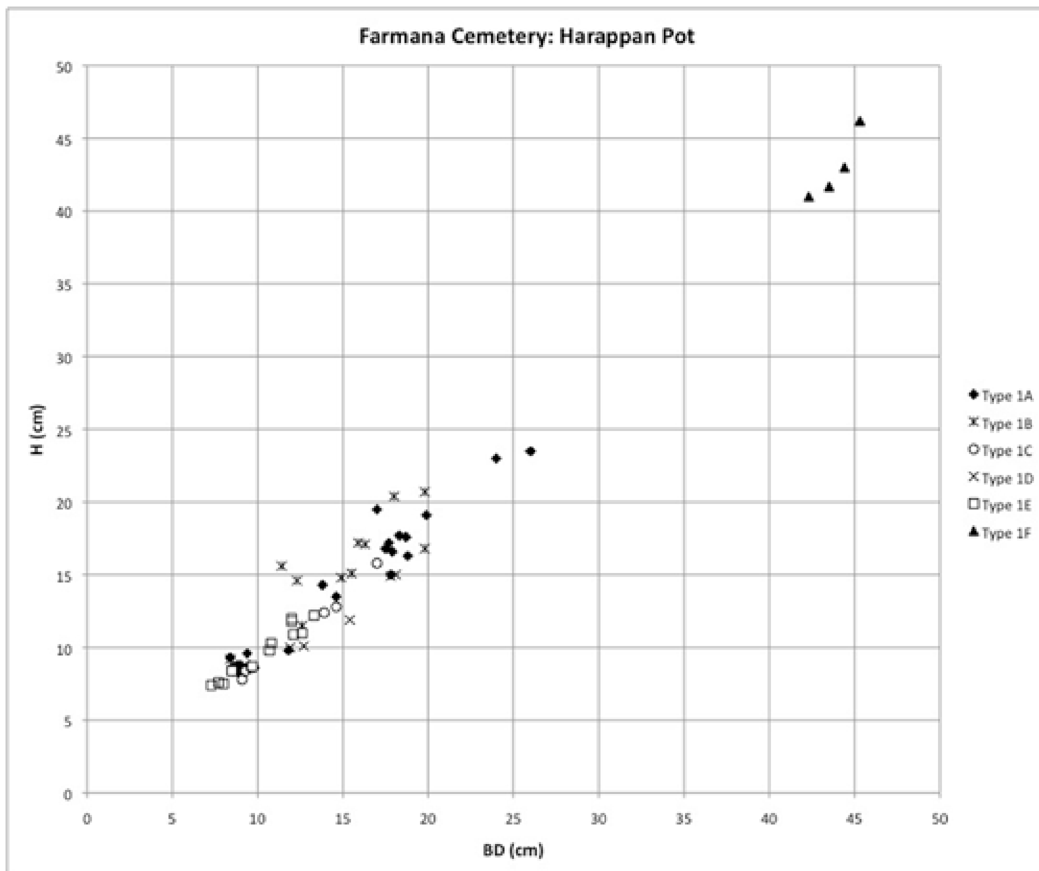


Figure 9.3 Scattergram showing the correlation of BD and H of the Harappan Pot Type 1

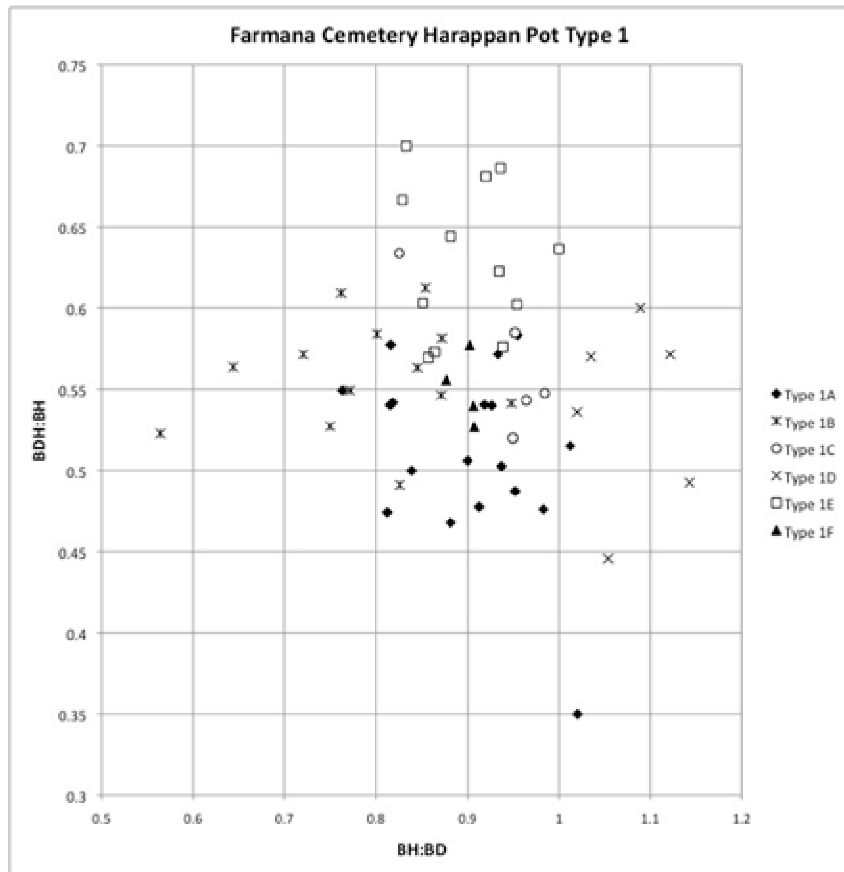


Figure 9.4 Scattergram showing the correlation of BH:BD and BDH:BH of the Harappan Pot Type 1

Table 9.7 H distribution of the Harappan Pot Type 1

Class	***Range***	***no,***
Class 1	0.1 - 5.0 cm	0
Class 2	5.1 - 5.0 cm	19
Class 3	10.1 - 15.0 cm	17
Class 4	15.1 - 20.0 cm	19
Class 5	20.1 - 25.1 cm	1
Class 6	25.1 - 30.0 cm	1
Class 7	30.1 - 35.0 cm	0
Class 8	35.1 - 40.0 cm	0
Class 9	40.1 cm -	4

Table 9.8 Relation between the Base Types and the Body Types

	Base Type		
Type	***1***	***2***	***3***
Type 1A	15	5	5
Type 1B	11	4	1
Type 1C	0	5	2
Type 1D	6	2	1
Type 1E	4	10	0
Type 1F	0	5	0

Table 9.9 Relation between the Base Types and size classes

	Base Type		
Size	***1***	***2***	***3***
Class 1	0	0	0
Class 2	6	13	0
Class 3	11	7	0
Class 4	12	1	6
Class 5	0	0	1
Class 6	0	0	1
Class 7	0	0	0
Class 8	0	0	0
Class 9	0	4	0

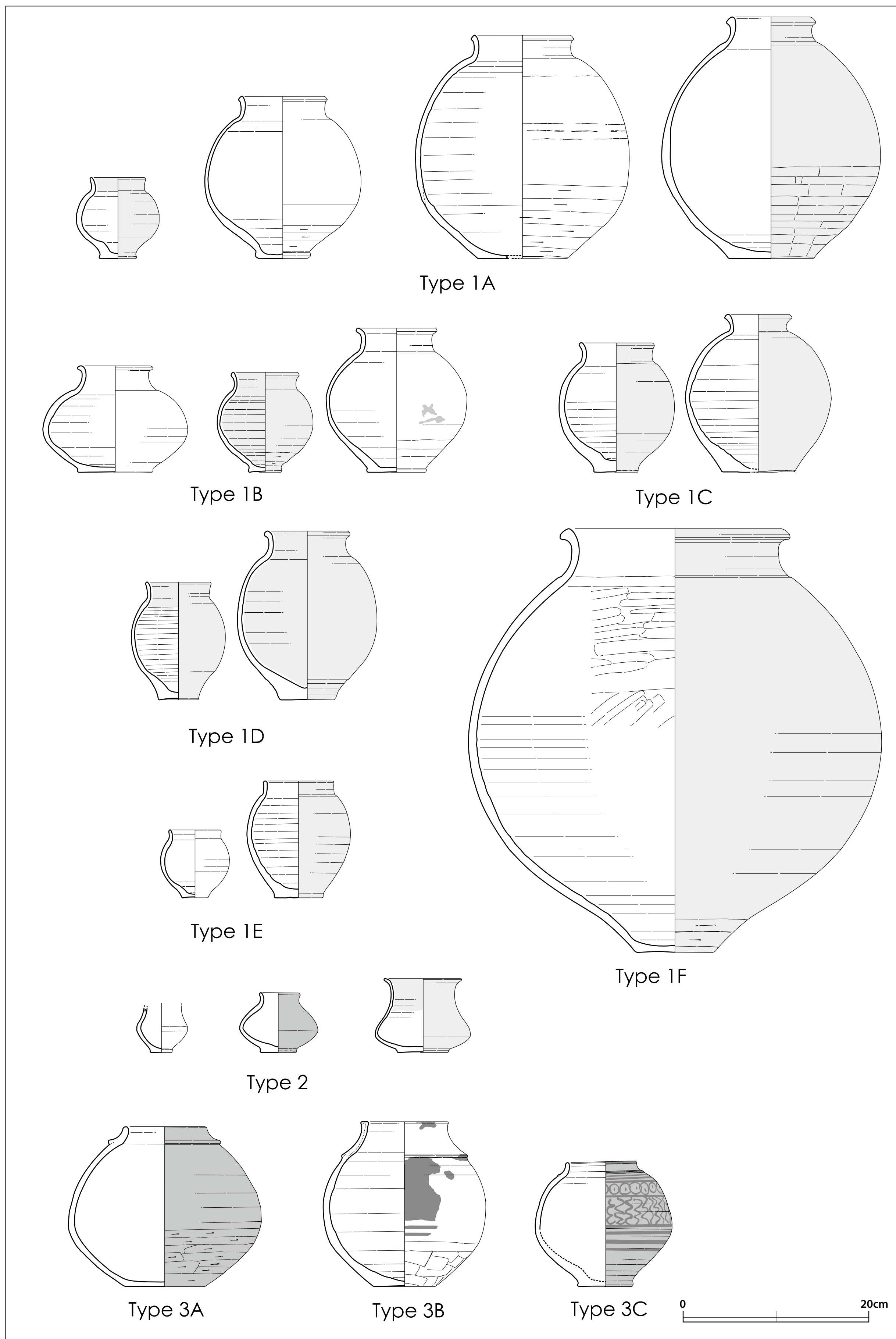


Figure 9.5 Harappan Pot Types with representative specimens

similar pattern ranging from Classes 2 to 4. Type 1E has no specimen in Class 4, showing a concentration in Classes 2 and 3.

The base shapes can be classified into the following types.

Base Type 1 Disc-shaped base
Base Type 2 Constricted base
Base Type 3 Flat base

Whereas Base Type 1 occurs in Types 1A, 1B and 1D with the largest number among the Base Types, Base Type 2 are prominent in Types 1C, 1E and 1F (Table 9.8). Looking at the relations between the Base Types and the size (Table 9.9), Base Type 1 is found in more numbers in Classes 3 and 4 while Base Type 2 exhibits a concentration in Classes 2 and 3. Base Type 2 is also exclusively observed in Type 1F. Base Type 3 are confined to relatively larger sizes of larger than Class 4.

[Type 2]

Three specimens from three burials having a carination or a sharp ridge on the body are included in this type (Figure 9.5). The overall shapes differ from each other.

B1 P12-2 is a small pot with a carinated or ridged body and a disc base. It measures 5.4 cm in BD.

B4 P8 has a biconical body and a short neck with a disc base. It measures 4.1 cm in RD, 6.4 cm in H, and 8.5 cm in BD. It is slipped in red on the external side.

B17 P7 consists of a carinated lower part of the body and a gently out-curved rim-neck. It has a disc base. It measures 8.2 cm in RD, 8.0 cm in H and 10.2 cm in BD.

[Type 3]

Type 3 is a kind of Flanged Pot having a ledge at the juncture between the neck and the body (Figure 9.5). Four specimens were found in four burials. Base on the overall shapes, they can be classified into the following types.

Type 3A Having a body with a lower gravity and a flat base, and a salient ledge at the juncture between the neck and the body.
Type 3B Having a globular body and a salient ledge at the juncture between the neck and the body.
Type 3C Having a slender body with a disc base and a low raised band at the juncture between the neck and the body.

Type 3A

This type is distinguished by a body which shows the BDH/BH indexes of 0.42 - 0.44 and a salient ledge at the juncture between the neck and the body. Two specimens were found in two burials (B6, B39), measuring 8.6 - 9.5 cm in RD, 17.2 – 18.1 cm in H, 20.7 – 21.6 cm in BD and 8.5 – 9.4 cm in BSD. The rim is simply rounded.

Both specimens are executed with a red slip on the external side, one of which is slipped in white on the internal surface.

The surface is entirely smoothened with rotation and then is finished by scraping with rotation on the external surface of the lower part of the body.

Type 3B

This type includes one specimen from one burial (B1 P3) which has a globular body with the BDH/BH index of 0.62. Only one specimen is found in burials. It has a flat face on the lip and a flat base. It measures 9.18 cm in RD, 17.7 cm in H, and 17.5 cm in BD. It seems likely that a wide black band was painted over the external surface of the body from the rim to the middle part of the body, accompanied with two parallel horizontal bands below it. It is entirely smoothened with rotation and then finished by discontinuous scraping on the external surface of the lower part of the body.

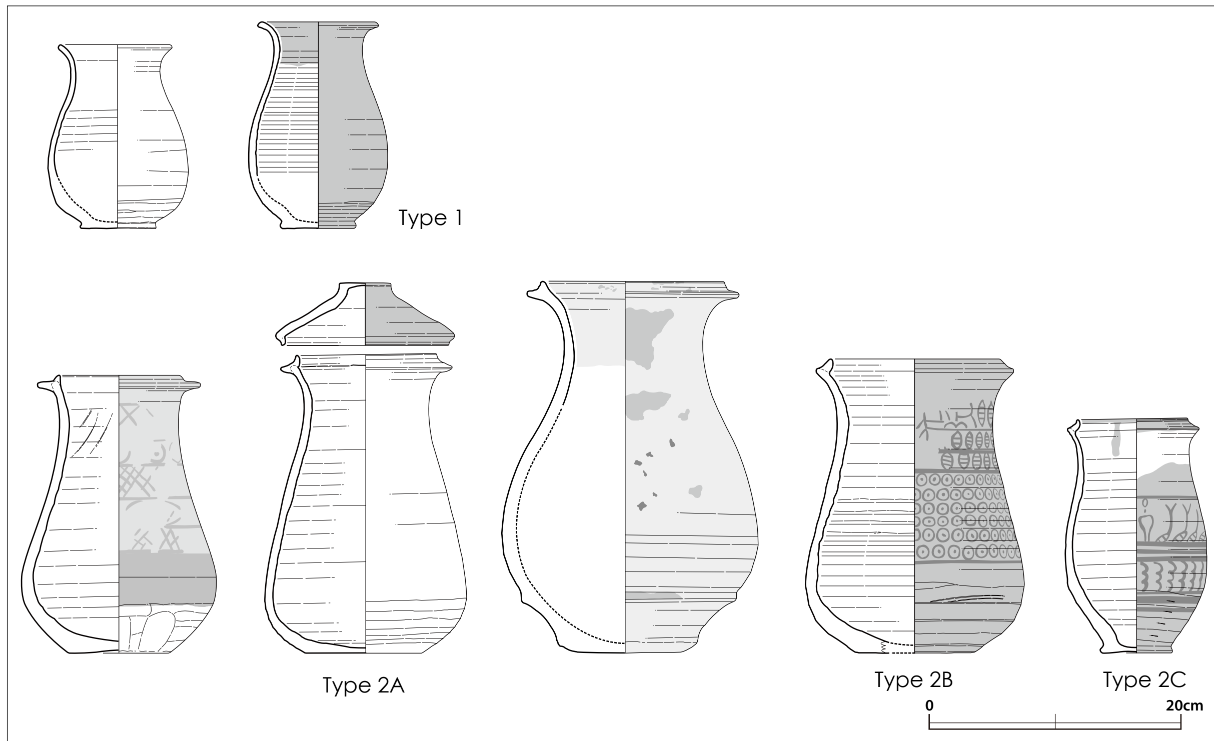


Figure 9.6 Harappan Jar Types with representative specimens

Type 3C

This type is represented by only one specimen from one burial (Burial no. 32 P14) which consists of a globular body with a disc base. It has, instead of a ledge, a low raised band at the juncture between the neck and the body. The rim is simply rounded. It measures 7.3 cm in RD, 13.5 cm in H, and 14.7 cm in BD. It is entirely smoothened with rotation and then finished by scraping with rotation on the external surface of the lower part of the body.

It is painted in black on the external surface with parallel horizontal bands which demarcate two horizontal registers. In the upper register are painted with adjoining dots-in-circles and the lower register is filled by vertical wavy lines.

3.3 Jar

(Figure 9.6)

Only nine specimens of Jars were found in six burials (Burial nos. 1, 6, 27, 32, 39, 50A). They can be classified into the following types based on the overall shapes (Figure 9.6).

Type 1 Having a simple out-curved neck with no flange.

Type 2 Having a flanged rim.

[Type 1]

Three specimens of Jar Type 1 are identified in two burials (Burial nos. 6 and 27). All of them are distinguished by elongated elliptical bodies and out-curved necks. The BDH ranges from 0.34 to 0.39. Two specimens which are measurable with their RD and H measure 8.7 cm to 9.0 cm in RD and 14.6 cm to 16.5 cm in H. They are accompanied with disc-shaped bases.

[Type 2]

Type 2 is distinguished by flanged rim to receive lids. This is so-called S-shaped Jars. Six specimens were unearthed from five burials (Burial nos. 1, 6, 32, 39 and 50A). Five specimens are intact with their entire shapes, while one specimen is represented only by its rim portion. They can be further sub-divided into the following types.

Type 2A Having a body with a lower gravity and a prominently projecting flange.

Type 2B Having a body with a lower gravity and a ridged rim.

Type 2C Having a slender body and a ridged rim.

[Type 2A]

Type 1 is distinguished by a body with a lower gravity and a prominently projecting flange. Three specimens from three burials (Burial nos. 1, 6 and 50A) are classified in this type, among which three specimens are intact with an entire shape and one specimen with only a rim-neck portion. They measure 9.6 – 25.0 cm in RD, 22.0 – 29.6 cm in H, and 15.4 – 20.2 cm in BD. The one which measures 25.0 cm in RD is a rim-neck sherd.

B1 P10 is slipped with a whitish slip and painted with reddish colour, although the external surface has been widely rubbed off. Parallel horizontal bands which demarcate horizontal registers and oblique chequerboard pattern and dots-in-circles which are filled in the registers can be observed.

B6 P2 is accompanied with a lid which is an inverted shallow bowl with a flat base. It measures 13.2 cm in RD, which corresponds to the RD of the Flanged Jar.

In B50A XXX, broken faces can be observed on the external side of the base indicating a possibility that a kind of pedestal accompanied with this specimen. An appliqué band with a triangular section is applied to the external surface of the lower part of the body. A whitish slip is executed over the internal surface of the rim-neck and the entire external surface. A red slip and black paintings are partially intact on the external surface, although the painting pattern is uncertain due to the bad preservation.

All the specimens are smoothened with rotation and finished by scraping with rotation on the external surface of the lower part of the body.

[Type 2B]

This type consists of a body with a lower gravity as indicated by a BDH/H index of 0.24 and a ridged rim. Only one specimen is attested in the burial pottery (Burial no. 39), measuring 13.4 cm in RD, 23.3 cm in H and 17.4 cm in BD. The entire surface is smoothened with rotation and then the external surface of the lower part of the body is finished by scraping with rotation.

It is slipped in red on the external surface and is painted in black. The painting pattern consists of parallel horizontal bands which demarcate two horizontal registers. In the upper register, branched plant motif is depicted, while dots-in-circles are densely arranged in the lower register.

[Type 2C]

This type is represented by only one specimen from one burial (Burial no. 32 P1-1) which has a slender body and a ridged rim. It has a disc base. It measures 8.7 cm in RD, 18.5 cm in H, and 11.3 cm in BD. The entire surface is smoothened with rotation, and then the external surface of the lower part of the body is finished by scraping with rotation.

The rim and the external surface of the body are slipped in re and is painted in black with parallel horizontal bands which demarcate two horizontal registers on the body. Leaf motifs are depicted vertically in the upper register, whereas vertical wavy lines are filled in the lower register.

3.5 Bowl
(Figure 9.7)

Five bowls were found in four burials (Burial nos. 1, 10, 65 and 70) suggesting that bowls were not popular as a burial pot. They can be classified into the following types based on the overall shapes (Figure 9.7).

Type 1 Having a nail-headed rim.

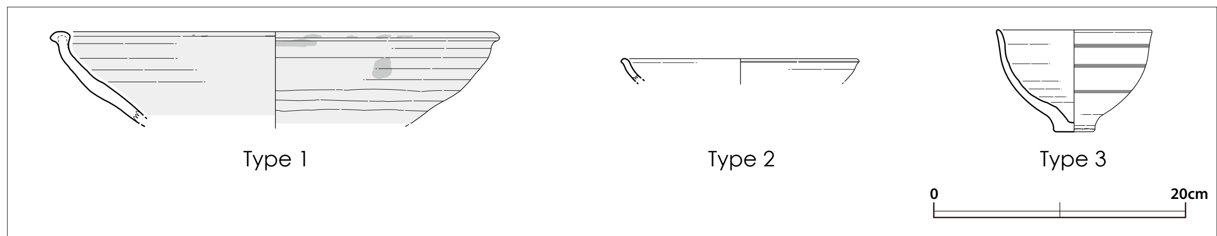


Figure 9.7 Harappan Bowl Types with representative specimens

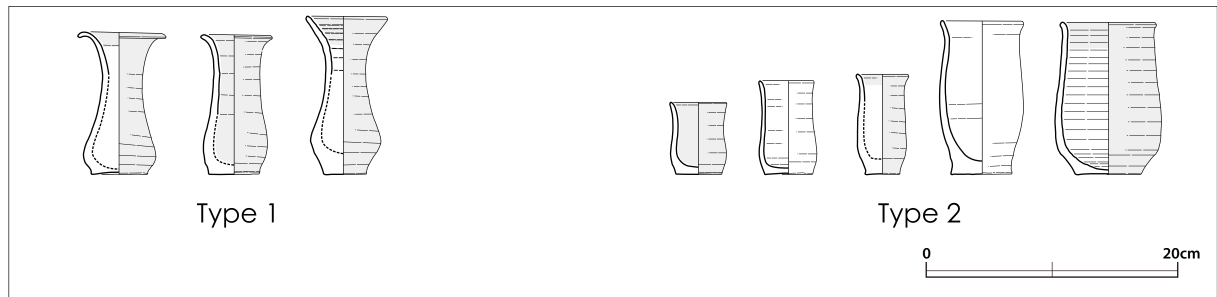


Figure 9.8 Harappan Beaker Types with representative specimens

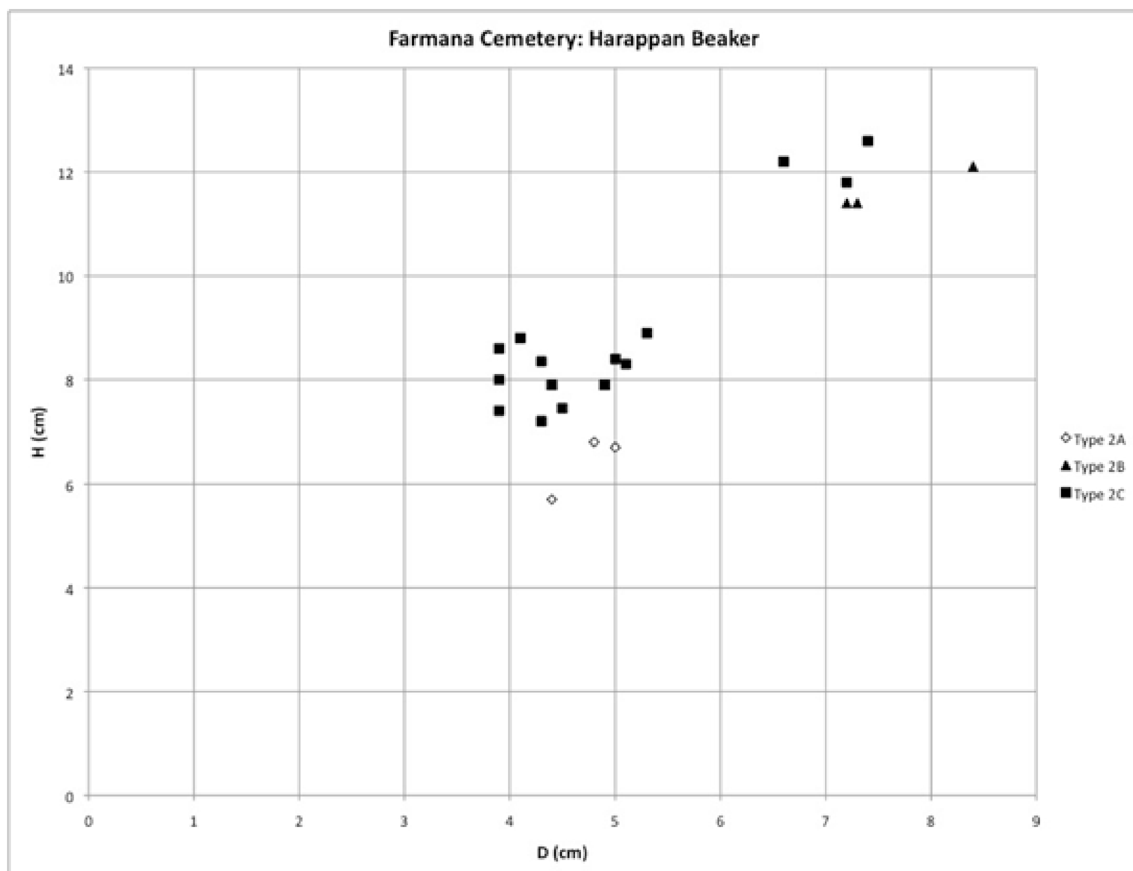


Figure 9.9 Size distribution of the Harappan Beaker

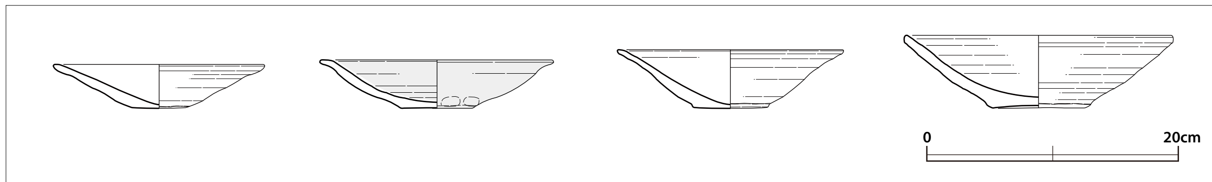


Figure 9.10 Harappan Dish with representative specimens

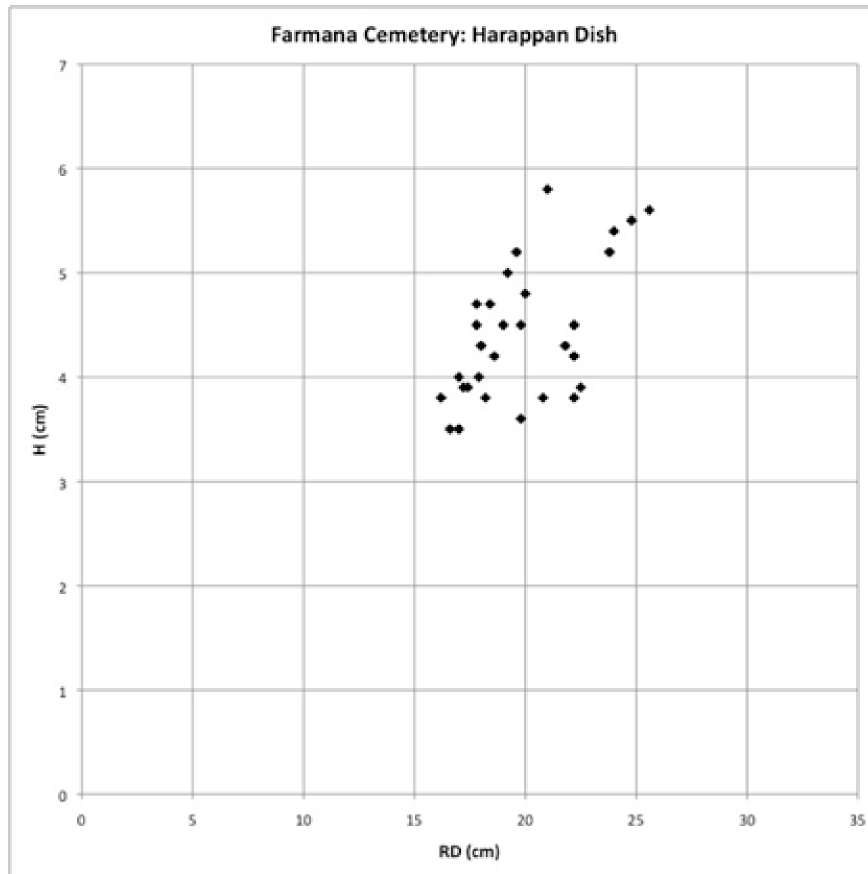


Figure 9.11 Size distribution of the Harappan Dish

Type 2 Having a shallow body with a slightly out-turned rim.

Type 3 Having a hemispherical body with a flat base and a shortly out-curved rim.

[Type 1]

This type is distinguished by a nail-headed rim which has projections on both sides on the rim. Based on the intact portion, they may have been relatively shallow as a whole. Two specimens are identified in this type in two burials (Burial nos. 10 and 65). They measure 34.4 – 38.6 cm in RD. The surface is entirely smoothened with rotation and then the external surface of the lower part of the body is finished by scraping with rotation. One specimen is slipped in red.

[Type 2]

This type has a shallow body and a slightly out-turned rim. It is represented by only one specimen from one burial (Burial no. 70 P15) which is intact only with the rim-neck portion. It measures 18.4 cm in RD.

[Type 3]

This type is characterized by a hemispherical body with a small flat base and a shortly out-turned rim. Two specimens are attested in one burial (Burial

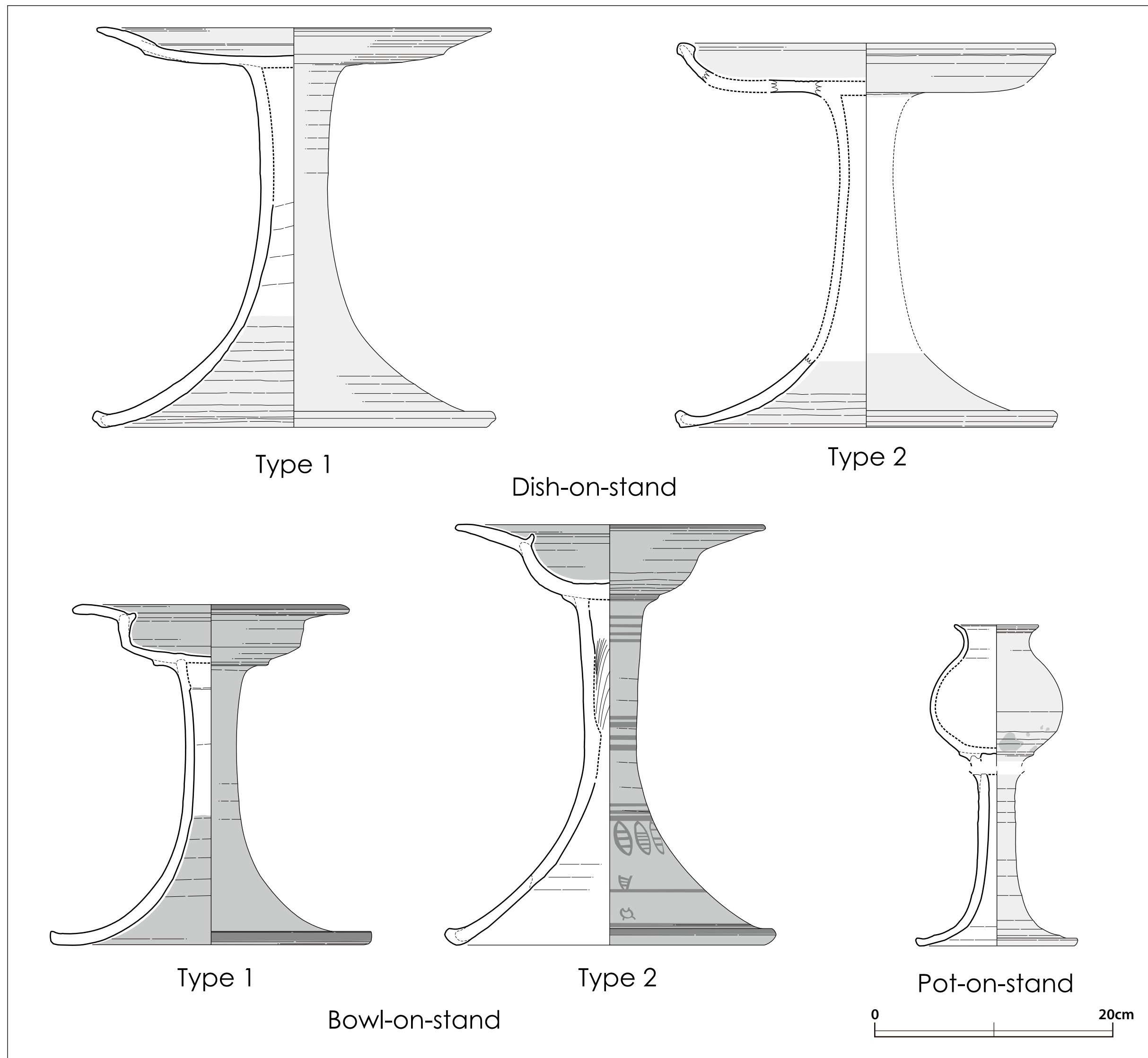


Figure 9.12 Harappan Dish-on-Stand and Bowl-on-Stand with representative specimens

no. 1), one of which is missing its rim. Both specimens are almost of the same size. One specimen which is intact with the rim measures 12.2 cm in RD and 8.1 cm in H. The base ranges from 3.0 cm to 3.2 cm in diameter. Both specimens are painted in black with parallel horizontal bands.

3.6 Beaker

(Figures 9.8 - 9.9)

Beaker can be defined as showing the H/BD ranging from 1.30 to 3.15. It was found in 39 specimens from 16 burials. They can be classified into the following types based on the rim-neck shapes and the body shapes (Figure 9.8, 9.9) .

Type 1 Having a slender body with a flaring neck.

Type 2 Having a cylindrical body with a shortly everted neck.

[Type 1]

Type 1 is represented by eight specimens from five burials (Burial nos. 23, 28, 40, 68 and 70) which measure 4.4 - 8.2 cm in RD, 2.7- 5.2 cm in ND, 7.9 - 12.7 cm in H, and 4.4 - 6.9 cm in BD. The H/BD index ranges from 1.7 to 2.4 and RD/ND index from 1.41 to 2.44. The surface is entirely smoothened with rotation.

[Type 2]

29 specimens are identified as Type 2 from 12 burials (Burial nos. 1, 12, 17, 18, 22, 23, 28, 29, 32, 44, 54 and 64), measuring 3.4 - 7.4 cm in RD, 5.7 - 12.6 cm in H and 3.6 - 8.4 cm in BD. The H/BD index varies from 1.3 to 2.21.

Based on the ratio between H and BD, they can be further classified into three types.

Type 2A Having a short profile H/BD: 1.30 - 1.42
Type 2B Having a wide mouth H/BD: 1.44 - 1.58
Type 2C Having a slender profile H/BD: 1.61 - 2.21

The surface is entirely smoothened with rotation.

3.7 Dish
(Figures 9.10 - 9.11)

The Harappan Dish is distinguished by a uniform shape having a flat base and a body opening straight from the base to the rim (Figure 9.10). 39 specimens from 22 burials (Burial nos. 1, 3, 4, 6, 8, 11, 12, 17, 22, 23, 25, 28, 29, 32, 40, 41, 49, 50A, 62, 64, 65 and 68) are identified as a dish. The RD ranges from 15.2 cm to 31.0 cm and the height varies from 3.5 cm to 5.8 cm (Figure 9.11). The BSD shows a range of 4.2 - 10.6 cm. The entire surface is smoothened with rotation. String-cut marks are left on the external side of the base.

3.8 Dish-on-Stand
(Figure 9.12)

Dish-on-Stands are represented by 22 specimens from 15 burials, among which 14 specimens are intact with the dish portion and the rest are only with the pedestal portion. The dish portion can be classified into the following types (Figure 9.12). The pedestal portion is distinguished by a uniform shape which consists of a slender stem and flaring lower part.

Type 1 Having a ledged body with a flaring neck.
Type 2 Having a shallow body gently incurved into the rim.

[Type 1]

13 specimens from 13 burials (Burial nos. 1, 18, 25, 27, 32, 39, 40, 48, 50B, 53, 54, 56 and 68) are classified in Type 1, measuring 30.4 - 35.6 cm in RD, 24.7 - 38.8 cm in H, 3.0 - 5.1 cm in DH, 20.6 - 34.0 cm in PH and 28.0 - 35.0 cm.

In three specimens (Burial no. 25 P4-1, Burial no. 48 P1, Burial no. 50B P2-1) the rim is painted in black with a narrow band and in three specimens the pedestal rim is executed with a narrow black band. In six specimens (Burial no. 40 P9, Burial no. 48 P1, Burial no. 50B P2-1, Burial no. 53 P2-1, Burial no. 54 P1, Burial no. 56 P5) are attested concentric grooves on the internal surface of the dish.

In regards to the manufacturing technique, the dish portion is entirely smoothened with rotation and is finished by shallow scraping with rotation on the external surface of its lower part. The pedestal portion is smoothened with rotation on its external side and is scraped without rotation on the internal surface of its lower part. The internal surface of the stem shows traces of squeezing with rotation to make a slender stem.

[Type 2]

Type 2 is represented by two specimens from two burials (Burial nos. 27 and 40) having a shallow body gently incurved into the nail-headed rim. In B27 P2, a shallow ridge is made on the lower part of the body. They measure 24.0 - 31.2 cm in RD. In B40 P6-1 which is also intact with a pedestal rim, BSD measures 31.0 cm. One specimen (B27 P2) is slipped in white on the internal surface and in red on

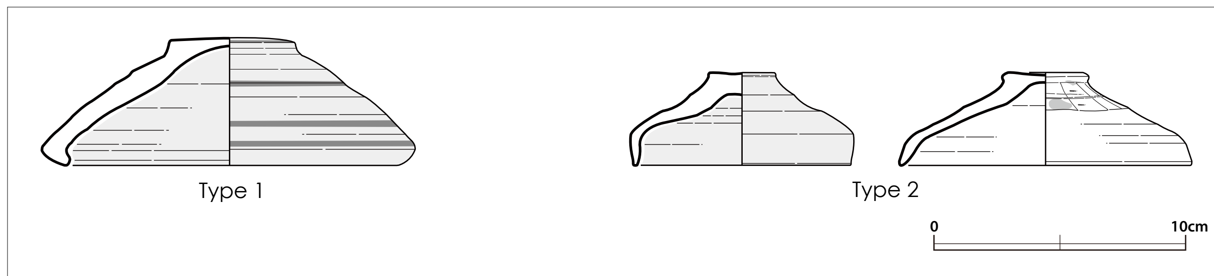


Figure 9.13 Harappan Lid Types with representative specimens

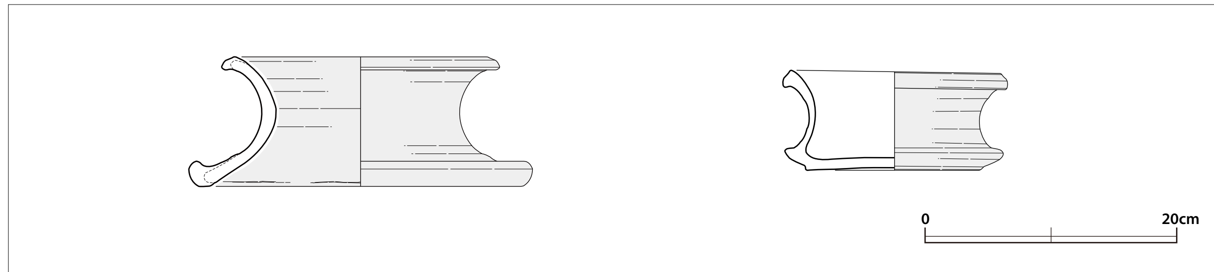


Figure 9.14 Harappan Stand with representative specimens

the external surface. The manufacturing technique is common to that of Type 1.

[Pedestal sherds]

Seven specimens of pedestal sherds were found in six burials (Burial nos. 1, 6, 11, 25, 27 and 50B). As noted above, the pedestal portion is distinguished by a slender stem and a flaring lower part. They measure 25.4 - 35.0 cm in BSD.

[Classification of the pedestal rim]

A tentative classification of the pedestal rim shapes is shown below.

Base Type 1 Having a rim slightly out-curved.
Base Type 2 Having a slightly out-curved rim with a ledge on the lower part of the rim.
Base Type 3 Having a simple rim without out-curved.

3.9 Bowl-on-Stand
(Figure 9.12)

Seven specimens of Bowl-on-Stands were found in seven burials (Burial nos. 1, 6, 20, 27, 32, 39 and 68). The bowl portion is distinguished by a rim-neck which is splayed out from the body (Figure 9.12). The pedestal portion is common to that of the Dish-on-Stands. The body shape of the bowl portion can be classified into the following types.

Body Type 1 Having a shallow or squat globular body. (n=4)
Body Type 2 Having a low cylindrical body with a flat base. (n=2)

Except for one specimen (B32 P6-1) which has Body Type 1, a projection is applied to the internal surface of the juncture between the body and the neck of the bowl. In B68 P2 with Body Type2 and B27 P4-1 of Body Type 1, a salient ledge is made at the juncture between the bowl and the stem. Similarly, in B6 P9-1 and B39 P1-1, a low ledge can be observed at the same portion.

They measure 21.0 - 25.4 cm in RD, 28.6 - 35.5 cm in H, 4.9 - 6.3 cm in DH, 23.7 - 29.2 cm in PH and 23.0 - 30.0 in BSD.

In B68 P2 a narrow black band is painted on the rim and the pedestal rim. B 39 P1-1 shows sets of

three or four parallel horizontal bands are painted at intervals on the external surface of the pedestal, in addition to the narrow black bands on the rim and the pedestal rim. On the lower part of the pedestal of this specimen, leaf motifs represented by an hatched almond shape are arranged in several courses.

3.10 Pot-on-stand

(Figure 9.12)

One specimen of the Pot-on-Stand was found in a burial (Burial no. 6). The pot portion measures 6.9 cm in RD, 10.6 cm in H and 11.0 cm in RD. A ledge is made at the juncture between the pot and the pedestal. The pedestal is slender in shape.

3.11 Lid

(Figure 9.13)

Six specimens of the Lids were found in three burials. They show a shape on an inverted dish with a flat top. They can be divided into the following types (Figure 9.13).

Type 1 Having an inturned rim.

Type 2 Having a straight or out-turned rim.

[Type 1]

Four specimens of this type are identified in two burials (Burial nos. 6 and 39). Burial no. 39 yields three specimens, among which one specimen is painted in black with parallel bands on its external side.

[Type 2]

Two specimens were found in Burial no. 32.

3.12 Stand

(Figure 9.14)

Only two specimens of the Stands were unearthed from two burials (Burial nos. 27 and 50A) (Figure 9.14). One specimen from Burial no. 27 (P7) is distinguished by prominently out-curved ends with a hollow inside. Another specimen from Burial no. 56 (P8-1) has a closed base having an out-curved rim and a ridge near the base.

4 NON-HARAPPAN POTTERY

4.1 Formal classification of the Non-Harappan pottery

(Table 9.10)

In the same way as the Harappan pottery, the Non-Harappan pottery is classified based on the H/BD index and visual observations. The Pot, Jar, Bowl, Beaker, Dish, Dish-on-Stand, Pedestalled Bowl, Pot-on-Stand and Lid have been identified (Table 9.10).

4.2 Pot

(Figures 9.15 - 9.16, Tables 9.11 - 9.17)

96 specimens of the Non-Harappan Pots were found in 27 burials. The Non-Harappan Pots are distinguished by a quite uniform shape consisting of an elliptical body and a shortly out-curved neck, although there are some variations in the body shape. The base is generally a round base with a ring although there are some specimens with completely a round base. In terms of the manufacturing technique, the rim-neck portion is smoothened with rotation and the body portion is finished by smoothening or scraping without rotation. These features are common to those from the Settlement Area.

The overall distribution in size is shown in Tables 9.11 and 9.12. Quite clearly, there is a correlation

Table 9.10 Classification of the Non-Harappan forms

Forms	HT/BD	RD	H	BD
Pot	0.75 - 1.24	4.2 - 20.5	6.2 - 37.2	5.2 - 36.6
Jar	1.30 - 1.53	7.8 - 10.6	20.2 - 29.3	15.2 - 21.8
Bowl	0.30 - 0.49	10.8 - 31.4	4.0 - 10.2	-
Beaker	1.44 - 2.25	4.1 - 5.6	7.8 - 13.3	4.8 - 7.4
Dish	0.18 - 0.29	16.4 - 29.0	3.3 - 6.1	-
Dish-on-stand	-	23.2 - 26.0	22.0 - 23.0	-
Pedestalled Bowl	-	11.7 - 30.0	15.5 - 18.9	-
Pedestalled Pot	-	8.4 - 10.8	19.7 - 40.0	-
Lid	-	9.3 - 13.9	5.2 - 10.5	-

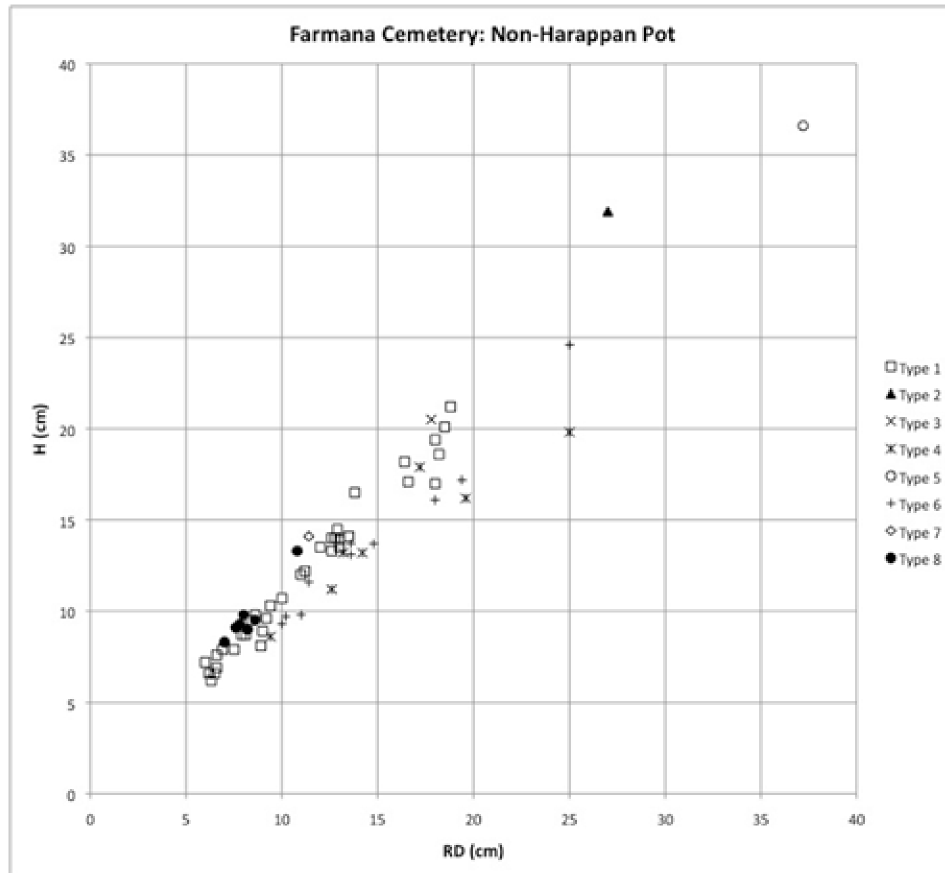


Figure 9.15 Size distribution of the Non-Harappan Pot

Table 9.11 RD distribution of the Non-Harappan Pot

RD Class	no.
Class 1	2
Class 2	63
Class 3	18
Class 4	1
Class 5	1

Table 9.12 H distribution of the Non-Harappan Pot

H Class	no.
Class 1	0
Class 2	26
Class 3	22
Class 4	11
Class 5	4
Class 6	0
Class 7	1
Class 8	1

Table 9.13 BDH/BH distribution of the Non-Harappan Pot

BDH/BH Class	Range	no.
Class 1	-0.41	4
Class 2	0.41 - 0.50	33
Class 3	0.51-0.60	26
Class 4	0.61-0.70	2

Table 9.14 BH/BD distribution of the Non-Harappan Pot

BH/BD Class	Range	no.
Class 1	0.51 - 0.60	1
Class 2	0.61 - 0.70	1
Class 3	0.71 - 0.80	7
Class 4	0.81 - 0.90	27
Class 5	0.91 - 1.00	26
Class 6	1.01 - 1.10	7
Class 7	1.11 - 1.20	2

Table 9.15 Classification of the Non-Harappan Pot

Type	Body shape	BDH/BH Class	BH/BD	no.
Body Type 1	elliptical	Class 1 - 3	Class 2 - 6	32
Body Type 2	globular	Class 2 - 4	Class 1 - 5	17
Body Type 3	oblong	Class 2 - 3	Class 4 - 6	6

Table 9.16 Size Distribution of the Non-Harappan Pot Type 1

	RD Class 2	RD Class 3
H Class 2	2	0
H Class 3	14	0
H Class 4	4	3
H Class 5	0	2

Table 9.17 NH/RD distribution of the Non-Harappan Pot Type 1

NH/RD Class	Range	Number
1	- 0.10	0
2	0.11 - 0.20	13
3	0.21 - 0.30	17
4	0.31 - 0.40	3
5	0.41 -	0

between the RD and H, but it is to be noted that even in the same class of RD, there is a variation in H making salient differences in overall shapes.

Next the formal classification based on the overall shapes is listed below (Table 9.13 - 9.15 and Figure 9.16).

Type 1 Having an elliptical body.

Type 2 Having an elliptical body, slightly slender and small in size.

Type 3 Having an elliptical body and a wide mouth, small in size.

Type 4 Having an oblong body, small in size.

Type 5 Having a globular body and a relatively taller neck.

Type 6 Having a globular body and a wide mouth.

Type 7 Having a globular body and a short neck.

Type 8 Having an elliptical body and a straight mouth.

Type 9 Having a globular body and a short neck with a wide mouth.

Type 10 Having an elliptical body and a flanged rim.

Type 11 Having a squat body with a flat base, Grey ware.

[Type 1]

Type 1 is characterized by an elliptical body and a short neck. This type is the commonest in Pots, represented by 50 specimens from 16 burials. They range from 6.4 cm to 12.2 cm in RD, 9.6 cm to 21.2 cm in H, 1.3 cm to 3.2 cm in NH, 8.6 cm to 18.8 cm in BD and 7.8 cm to 18.6 cm in BH. The relations between the RD and H are shown in Table 9.16. Those categorized in RD Class 2 and H Class 3 is dominant.

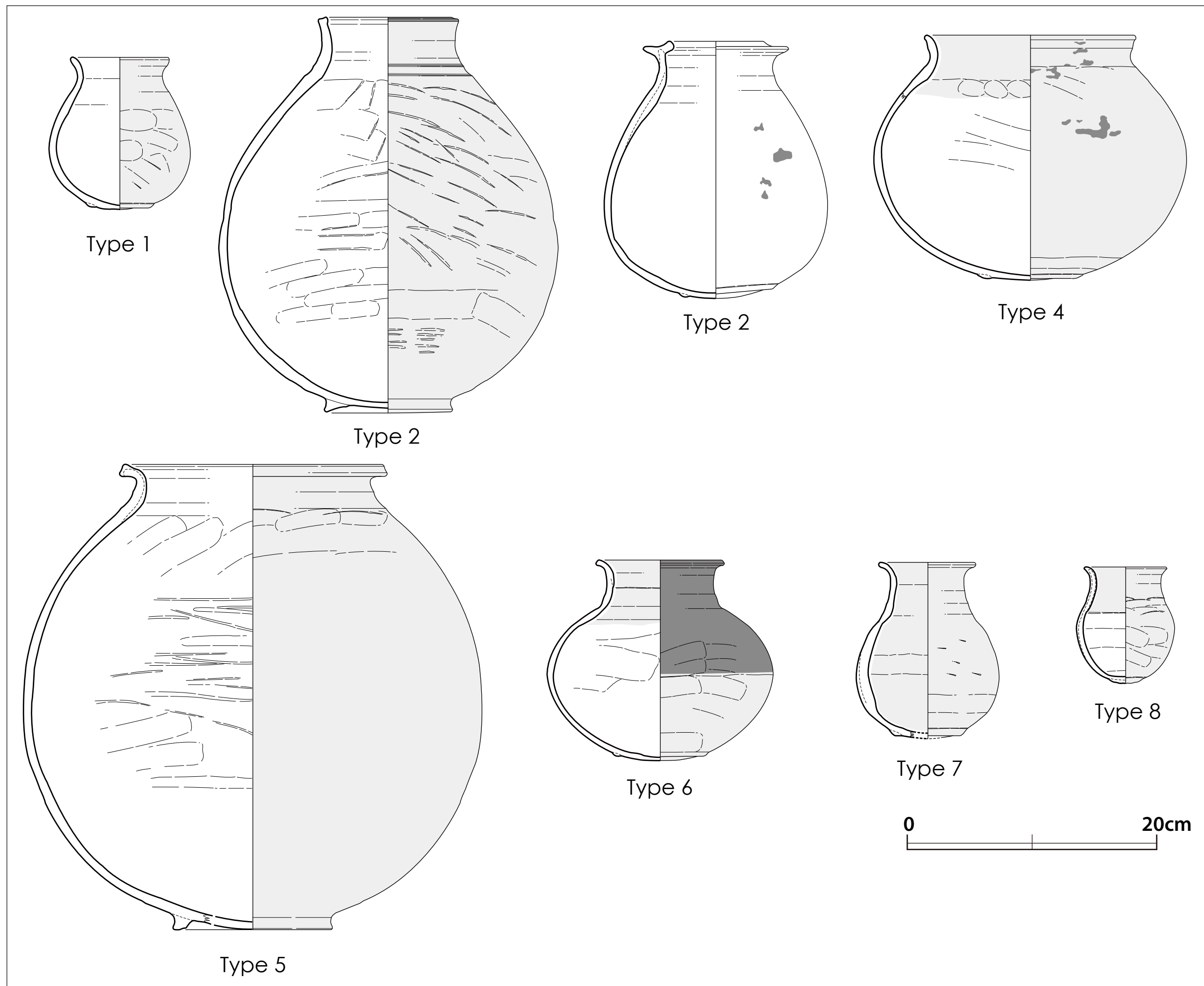


Figure 9.16 Classification of the Non-Harappan Pot

The NH/RD index ranges from 0.15 to 0.35. Table 9.17 show the number of specimens in class-wise. Classes 2 and 3 are dominant indicating that those with shorter necks are common.

The BD/BH index show a range of 1.01 - 1.29 and the BDH/BH index of 0.41 - 0.56.

The rim shape is simply rounded in all the specimens. In regards to the manufacturing technique, the rim-neck portion is smoothened with rotation and the body is finished by smoothening without rotation.

27 specimens are slipped in whitish colour and five specimens are in red. Three specimens are entirely plain. One specimen is painted with a narrow black band on the rim and two specimens are with a wide black band from the rim to the middle part of the body.

[Type 2]

Type 2 is represented by only one specimen (Burial no. 65 P2) which consists of an elliptical body and a straight neck. A flat face is made on the lip. The base is accompanied with a ring of a rectangular section. It measures 10.2 cm in RD, 31.9 cm in H, 4.0 cm in NH, 27.0 cm in BD, and 27.9 cm in BH.

Narrow black bands are painted on the rim and around the juncture between the neck and the body. The manufacturing technique is common to that of Type 1.

[Type 3]

This type is distinguished by a flanged rim and represented by only one specimen (Burial no. 70 P1). The body shape is akin to that of Type 1. The base is accompanied with a low ring. It measures 7.8 cm in RD, 11.6 cm in flange diameter, 20.5 cm in H, 2.1 cm

in NH, 17.8 cm in BD and 18.4 cm in BH. It shows a NH/RD index of 0.27, a BD/BH index of 0.97 and a BDH/BH index of 0.41.

The manufacturing technique is common to that of Type 1. Black paintings are partially intact on the external surface, indicating a possibility that a wide black band was painted from the rim to the body.

[Type 4]

Type 4 includes those specimens which has a globular body and a shortly out-curved neck. Seven specimens from six burials (Burial nos. 8, 10, 26, 39, 54 and 56) are included in this type. They range from 7.6 cm to 16.6 cm in RD, from 8.6 cm to 19.8 cm in H, from 1.4 cm to 2.4 cm in NH, from 9.4 cm to 25.0 cm in BD and from 6.6 cm to 17.7 cm in BH. Its limited number and irregular sizes may indicate that this type was not common as a burial pot.

They exhibit a range of 0.12 - 0.29 in the NH/RD index, 1.22 - 1.42 in the BD/BH index, 0.54 - 0.70 in the BDH/BH index.

In regards to the rim shape, all the specimens show a simple rounded rim, except for one specimen (B56 P8-2) which has a slightly thickened rim.

Two specimens are slipped in red and four specimens are in a whitish colour. Five specimens are painted with a wide black band from the rim to the body, although the preservation of black bands are not well in some specimens.

[Type 5]

This type is also represented by only one specimen (Burial no. 65 P17) which is composed of a globular body and an out-curved neck. The rim is out-turned from the neck having a shallowly grooved face on the external side. The base is accompanied with a ring of a trapezoidal section. It measures 20.5 cm in RD, 37.2 cm in H, 3.0 cm in NH, 36.6 cm in BD and 34.2 cm in BH.

The manufacturing technique is common to that of Type 1.

[Type 6]

Type 5 is distinguished by a globular body and a relatively taller neck, represented by 12 specimens from 11 burials (Burial nos. 10, 12, 17, 34, 48, 49, 52, 54, 62, 65 and 66) . They range from 6.0 cm to 10.4 cm in RD, from 9.3 cm to 17.2 cm in H, from 2.2 cm to 4.8 cm in NH, from 10.0 cm to 19.4 cm in BD and from 6.9 cm to 13.7 cm in BH. Whereas smaller ones dominates, there are a few larger specimens.

The NH/RD index of 0.29 - 0.49 indicates a relatively taller necks. The body shape are globular as indicated by the BD/BH index of 1.24 - 1.46 and the BDH/BH index of 0.41 - 0.61.

In terms of the rim shape, eight specimens have a rim which is out-turned from the neck. In three specimens, the rim is slightly thickened. These features point to that this type is quite distinctive among the Pot types, in combination with the rim-neck shape and body shape.

The manufacturing technique is common to that of Type 1, but the external surface are relatively well-smoothed.

Nine specimens are executed with a wide black band from the rim to the middle part of the body on the external side. Eight specimens are slipped in a whitish colour and four specimens are in red. Two specimens has no slip but is painted with a wide black band.

[Type 7]

This type consists of a globular body with a ring base and a tall neck with a shortly out-turned rim. Only one specimen is identified (Burial no. 56 P2). It measures 7.5 cm in RD, 14.1 cm in H and 11.4 cm in BD. The manufacturing technique is the same as that of other types.

[Type 8]

Type 8 is distinguished by an oblong body. Eight specimens from four burials are classified in this type, measuring 5.5 - 8.5 cm in RD, 8.3 - 13.3 cm in H, 1.2 - 2.3 cm in NH, 6.6 - 12.2 cm in BD and 6.8 - 11.4 cm in

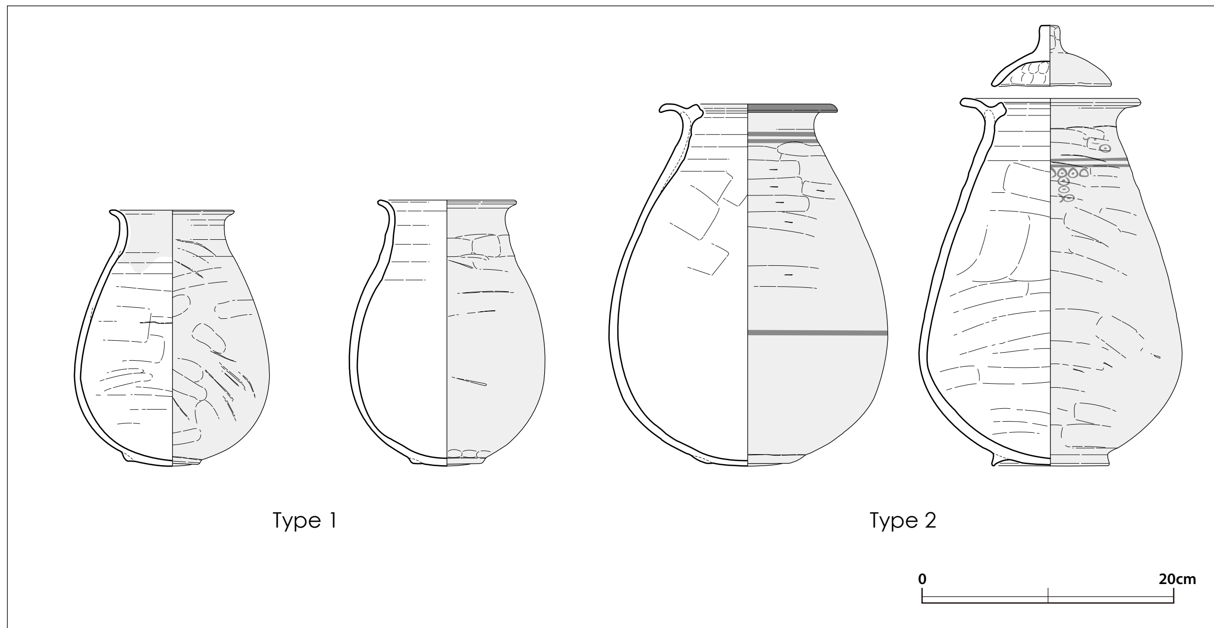


Figure 9.17 Classification of the Non-Harappan Jar

BH. This type is also represented by small ones.

They show a range of 0.17 - 0.35 in the NH/RD index, 0.82 - 1.15 in the BD/BH index, 0.49 - 0.60 in the BDH/BH index and 0.74 - 0.94 in the RD/BD index.

The rim is simply rounded. The manufacturing technique is common to that of Type 1. Eight specimens are slipped in a whitish colour and one specimen is in red. Three specimens are considered to have been painted in black with a wide band from the rim to the body, though the black painting is partially intact.

4.3 Jar
(Figure 9.17)

Jar is defined by H/BD indexes of more than 1.31 which means an elongated body (one specimen shows a figure of 1.29 but it is included in the Jar based on the visual identification). Five specimens are identified in five burials (Burial nos. 12, 53, 56, 62 and 65). Like Pots, they are distinguished by elliptical body and by technical features consisting of smoothening with rotation on the rim-neck and smoothening or scarping without rotation on the body. The base is round with a ring.

The rim shape shows the same variation as that of Pots (Figure 9.17).

Rim Type 1 Simply rounded or having a low ridge on the external side.
Rim Type 2 Flanged rim.

In H, two specimens with Rim Type 1 measure 20.2 cm and 23.3 cm and another two specimens with Rim Type 2 measure 28.8 cm and 29.3 cm respectively, showing that those with Rim Type 2 are larger than those with Rim Type 1, although the sample number is quite small.

4.4 Pedestalled Pot
(Figure 9.18)

Pedestalled Pot is distinguished by a pedestal attached to the bottom of a Pot. Eight specimens were found in six burials (Burial nos. 12, 27, 39, 50A, 65 and 70). The overall shape and technical features of the pot is the same as that of Pots. The pedestal is

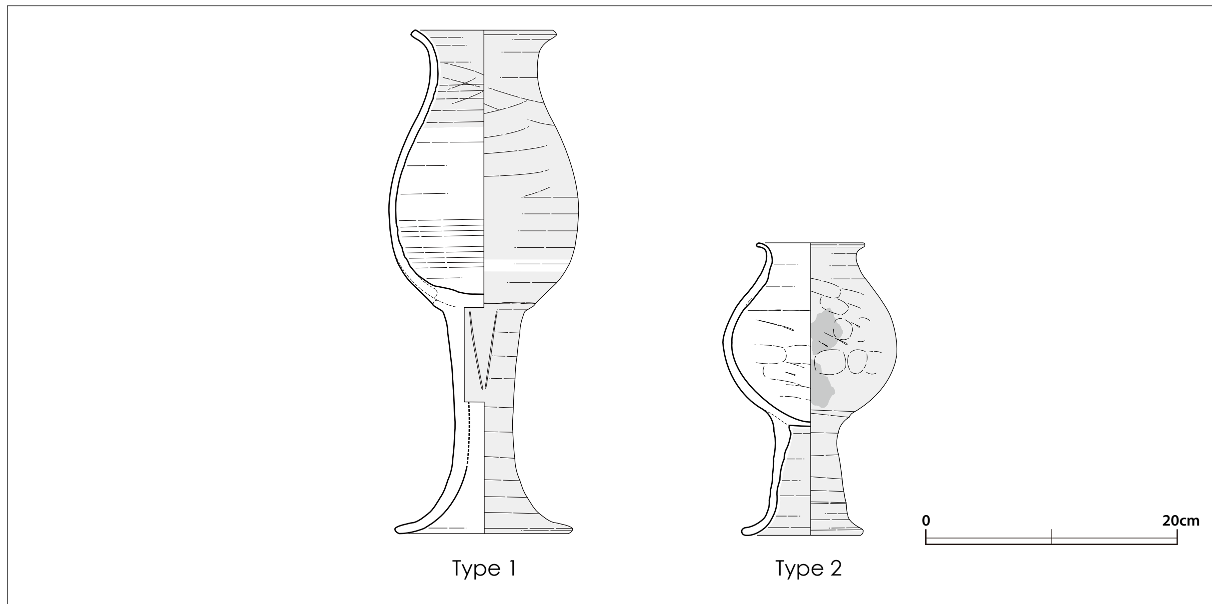


Figure 9.18 Classification of the Non-Harappan Pot-on-Stand

entirely finished by smoothening with rotation, but some specimens show traces of luting on the internal side suggesting that overall shape was modelled by luting technique and then finished by smoothening with rotation.

They can be classified into the following two types on the basis of the overall shapes (Figure 9.18).

Type 1 Slender pot having a tall pedestal.

Type 2 Globular pot with a low pedestal.

Although Type 1 is identified in three specimens from three burials (Burial nos. 27, 39 and 50A), two of them are missing some portions and only one specimen (B27 P5) shows the overall shape. In this specimen, the BD/BH index is 0.68 and the pedestal measures 18.0 cm in H. A post-firing graffiti of V shape is intact on the external side of the pedestal. Another two specimens (B50A P14, B39 P1) are likely to have had a similar shape.

Five specimens from three burials (Burial nos. 12, 65 and 70) are identifiable in Type 2. The BD/BH index varies from 1.03 to 1.14 and the pedestal measures 6.5 – 9.1 cm in H.

4.5 Bowl
(Figure 9.19)

24 specimens of Bowls were found in 18 burials. They can be classified into the following four types based on the overall shape and the rim-neck shape (Figure 9.19).

Type 1 Having a shallow body and a straight raised rim-neck.

Type 2 Having a hemispherical body and a out-curved neck.

Type 3 Having a hemispherical body and a straight neck.

Type 4 Having a shallow body and a gently out-curved neck.

[Type 1]

Only one specimen is attested in Type 1 (Burial no. 4 P2). It is painted in black with a narrow band on the rim and sets of parallel vertical strokes in four direction on the external side of the body. It measures 10.8 cm in RD and 4.0 cm in H. The rim-neck portion is smoothened with rotation and the body portion is finished by smoothening without rotation.

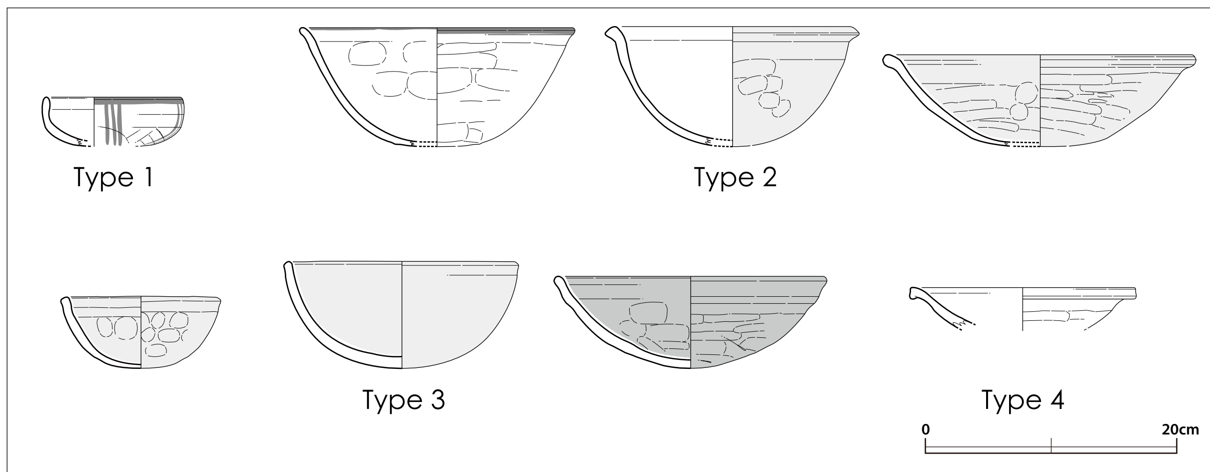


Figure 9.19 Classification of the Non-Harappan Bowl

[Type 2]

15 specimens from 12 burials (Burial nos. 8, 10, 15, 16, 26, 32, 33, 38, 40, 56, 64 and 67) are identified in Type 2. All specimens have a round base. They measure 13.0 - 31.4 cm in RD. There are variations in the neck portion.

Neck Type 1 Gently out-curved neck.
Neck Type 2 Sharply and shortly out-curved neck.

Rim Type 1 Simply rounded rim.
Rim Type 2 Thickened rim projecting outwards.

These neck types and rim types are related with each other, that is, Neck Type 1 is associated with Rim Type 1 and Neck Type 2 with Rim Type 2.

Three specimens are painted with a narrow black band. The technical feature are common to Type 1.

[Type 3]

Seven specimens from five burials (Burial nos. 39, 48, 50A, 52 and 62) are attested in Type 3. Six of them are intact with the overall shape showing a round base except for one specimen which has a ring base. They vary from 10.8 cm to 21.8 cm in RD and 4.3 cm to 8.9 cm in H. Three specimens are painted with a narrow black band (Burial no. 52 P1, Burial no. 52 P5, Burial no. 50A P17). The technical feature are common to Type 1.

[Type 4]

Type 4 is represented by only one specimen (Burial no. 52 P2). It consists of a shallow body and a gently out-curve neck. The rim is thickened, slightly drooping. It measures 17.6 cm in RD.

4.6 Pedestalled Bowl
(Figure 9.20)

Four specimens of Pedestalled Bowls were found in three burials (Burial nos. 12, 38 and 50A). They can be classified into the following three types based on the overall shape (Figure 9.20).

Type 1 Having a squat bowl with a flanged rim and a low pedestal.
Type 2 Having a bowl with a shortly everted neck and a slender pedestal.
Type 3 Having a bowl of hemispherical shape and a low pedestal.

[Type 1]

Two specimens of this type are identified in two burials (Burial nos. 12 and 50A). Type 1 ranges from 9.7 cm to 12.6 cm in RD and from 17.0 cm to 18.9 cm in H. The surface is entirely smoothened with rotation, but

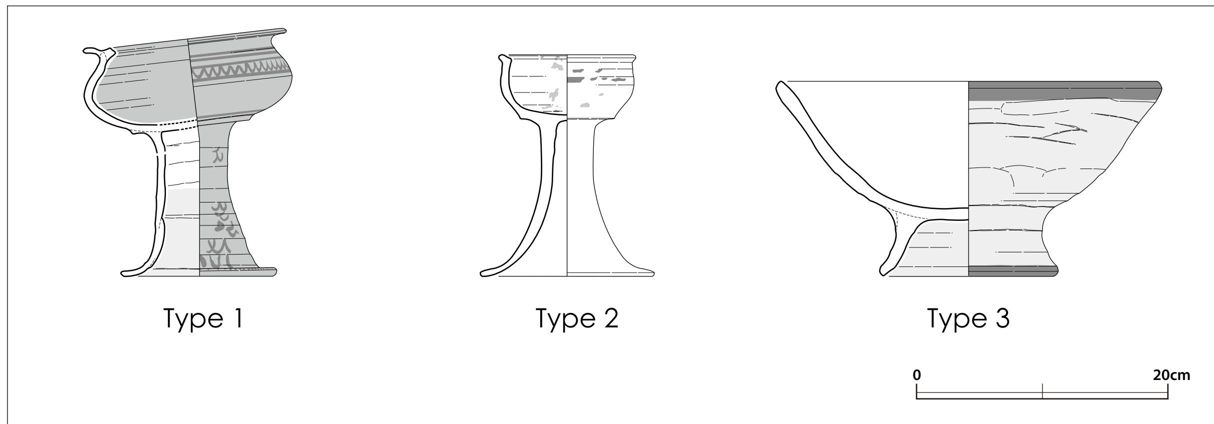


Figure 9.20 Classification of the Non-Harappan Pedestalled Bowl

some specimens show traces of luting on the internal side of the pedestal (B12 P6-1). The bowl and the pedestal were modelled separately and then jointed. Most specimens show distortion in the overall shape due to improper jointing between the bowl and the pedestal.

All specimens seem to have been painted in original as black pigments can be observed in a fragmentary condition, but most of the painting have been rubbed off making it difficult to see the painting pattern. Only one specimen (B12 P6-1) shows a painting pattern consisting of parallel horizontal bands and wavy bands on the external side of the body, and of wavy bands on the external side of the pedestal.

[Type 2]

Type 2 is represented by only one specimen (Burial no. 38) which measures 10.4 cm in RD, 17.6 cm in H, 5.6 cm in DH, and 11.9 cm in PH. Although it is difficult to observe the technical features due to the rubbed-off surface, it seems likely that the surface is entirely smoothened with rotation. Some traces of black paintings can be observed on the external side of the bowl, but the overall pattern is uncertain.

4.7 Beaker
(Figure 9.21)

Beaker is defined by the H/BD indexes of 1.59 – 2.25 showing a range of 4.2 – 5.6 cm in RD and 7.8 – 13.3 cm in H. 15 specimens from seven burials (Burial nos. 12, 25, 34, 41, 50A, 62 and 65) are identified as Beaker. In shape, it is distinguished by a cylindrical body which slightly bulges in its lower part and a gently out-curved neck. The base is flat or is accompanied with a ring.

They can be further classified into two types (Figure 9.21).

Type 1 Having a slightly bulging body.
Type 2 Having a cylindrical body.

Type 1 is identified in eight specimens in six burials (Burial nos. 12, 34, 41, 50A, 62 and 65). Type 2 is found in seven specimens from three burials (Burial nos. 12, 25, 65).

The entire internal surface and the upper part of the vessel are smoothened with rotation and the external surface of the lower part of the body is finished by smoothening without rotation. In some specimens, finger impressions are observable on the external side of the body.

Beaker is not found in the Settlement Area suggesting that this form is special to the burial pottery and is possibly influenced by the Harappan

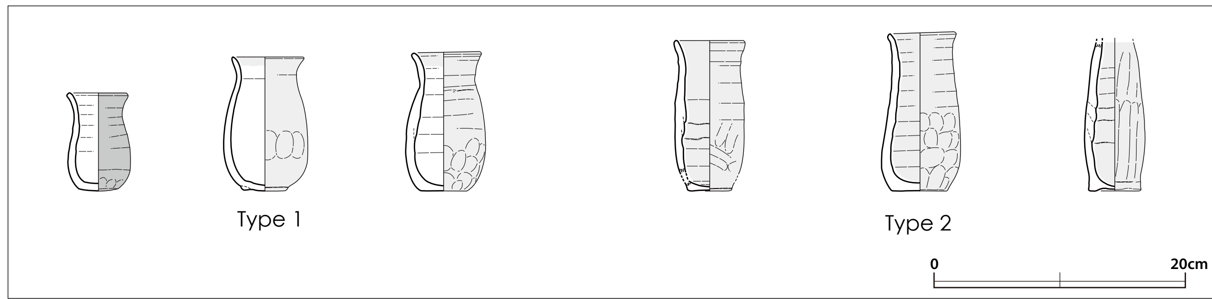


Figure 9.21 Classification of the Non-Harappan Beaker

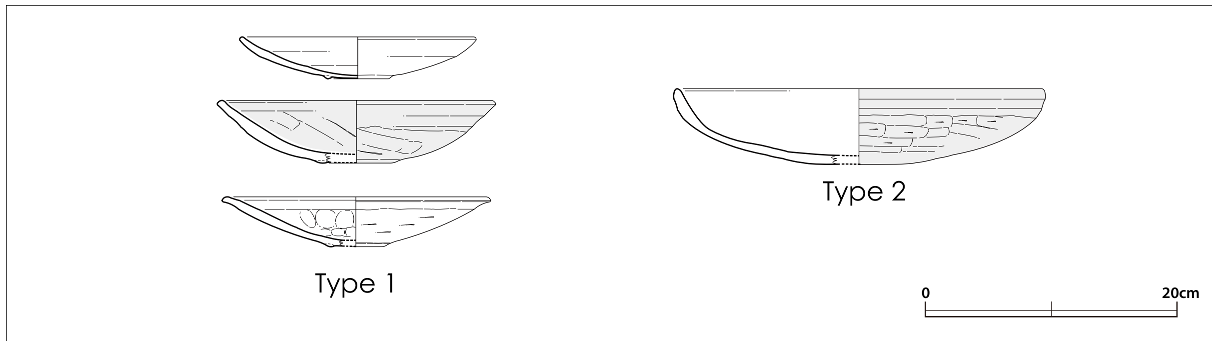


Figure 9.22 Classification of the Non-Harappan Dish

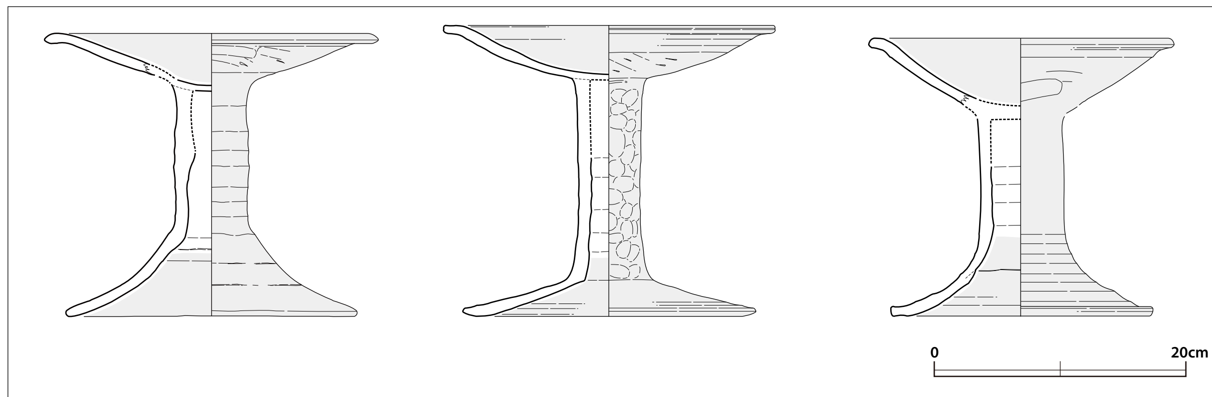


Figure 9.23 Classification of the Non-Harappan Dish-on-Stand

Beaker.

4.8 Dish
(Figure 9.22)

The Non-Harappan Dish is distinguished by a shallow body and a ring base. 15 specimens were found in nine burials (Burial nos. 12, 17, 25, 34, 41, 50A, 50B, 56 and 70). Among them, nine specimens of rim-neck sherds may belong to Dish-on-Stand. Among seven specimens which are intact with base, six specimens show a ring base. The rim-neck portion is smoothened with rotation and the body portion is finished by smoothening without rotation.

They can be classified into the following two types (Figure 9.22).

Type 1 Having a rim-neck and body extending straight from the base.
Type 2 Having a gently incurved rim-neck.

Type 1 is represented by 13 specimens from eight burials and Type 2 by only one specimen (Burial no.

17). In terms of the size, they show a range of 16.4 – 29.0 cm in RD and 3.3 – 6.1 cm in H.

As no specimen of the Non-Harappan Dish is found in the Settlement Area, it is special to the burial pottery. It is likely that it had been influenced from the Harappan Dish which occurred abundantly in the burial pottery.

4.9 Dish-on-Stand
(Figure 9.23)

The Non-Harappan Dish-on-Stand is characterized by a shallow dish and a pedestal which consists of a cylindrical stem and flaring lower part (Figure 9.23). Five specimens are attested from five burials (Burial nos. 6, 12, 33, 65 and 70). The dish portion is comprised by a body opening straight and a shortly everted rim-neck. The dish portion is finished by smoothening with rotation on its rim-neck and by smoothening without rotation on the body. The pedestal portion is entirely smoothened with rotation, but traces of luting on the internal side suggest a luting technique in modelling the pedestal.

In size, they varies from 23.2 cm to 26.0 cm in RD and from 22.0 cm to 23.0 cm in H.

The Non-Harappan Dish-on-Stand does not make appearance in the Settlement Area suggesting that it was unique to the burial pottery and that it was influenced by the Harappan Dish-on-Stand.

4.10 GW

Only one specimen of Grey ware is found in a burial (Burial no.10). It has a squat body with a flat base and a shortly out-curved neck. The rim is simply rounded. It measures 9.2 cm in RD, 9.2 cm in H, 1.7 cm in NH, 12.2 cm in BD and 7.5 cm in BH. The entire internal surface and the external surface of the rim-neck are smoothened with rotation and the external surface of the body is smoothened without rotation. On the internal surface of the body, traces of luting can be observed, which are likely to have been left on the surface in the modelling process. The surface is entirely slipped in a dark grey slip.

Table 9.18 Frequency of occurrence of forms

Harappan	***no. of burials***	***no. of specimens***	***Ubiquity***	***Average***
Pot	34	111	76%	3.3
Jar	6	9	13%	1.5
Bowl	4	5	9%	1.3
Beaker	16	39	36%	2.4
Dish	22	39	49%	1.8
DoS	15	22	33%	1.5
BoS	7	7	16%	1.0
PoS	1	1	2%	1.0
Lid	3	6	7%	2.0
Stand	2	2	4%	1.0
Non-Harappan				
Pot	27	95	60%	3.5
Jar	5	5	11%	1.0
P. Pot	6	8	13%	1.3
Bowl	17	24	38%	1.4
P. Bowl	3	4	7%	1.3
Beaker	7	15	16%	2.1
Dish	9	15	20%	1.7
DoS	5	5	11%	1.0
Lid	2	4	4%	2.0
GW Pot	1	1	2%	1.0

5 CORRELATION BETWEEN FORMS AND SHAPES IN BURIALS

Based on the above discussions on forms and shapes of cemetery pottery, this section discusses the correlation between forms and shapes in each burial.

5.1 Occurrences of forms
(Table 9.18)

The form of the Harappan pottery found in the largest number of burials is Pots (34 burials), followed by Dishes (22 burials), Beakers (16 burials), and Dish-on-stands (15 burials). Other forms are distinctively limited in number of burials. In number of specimens also, the Pots occupy the largest position (111

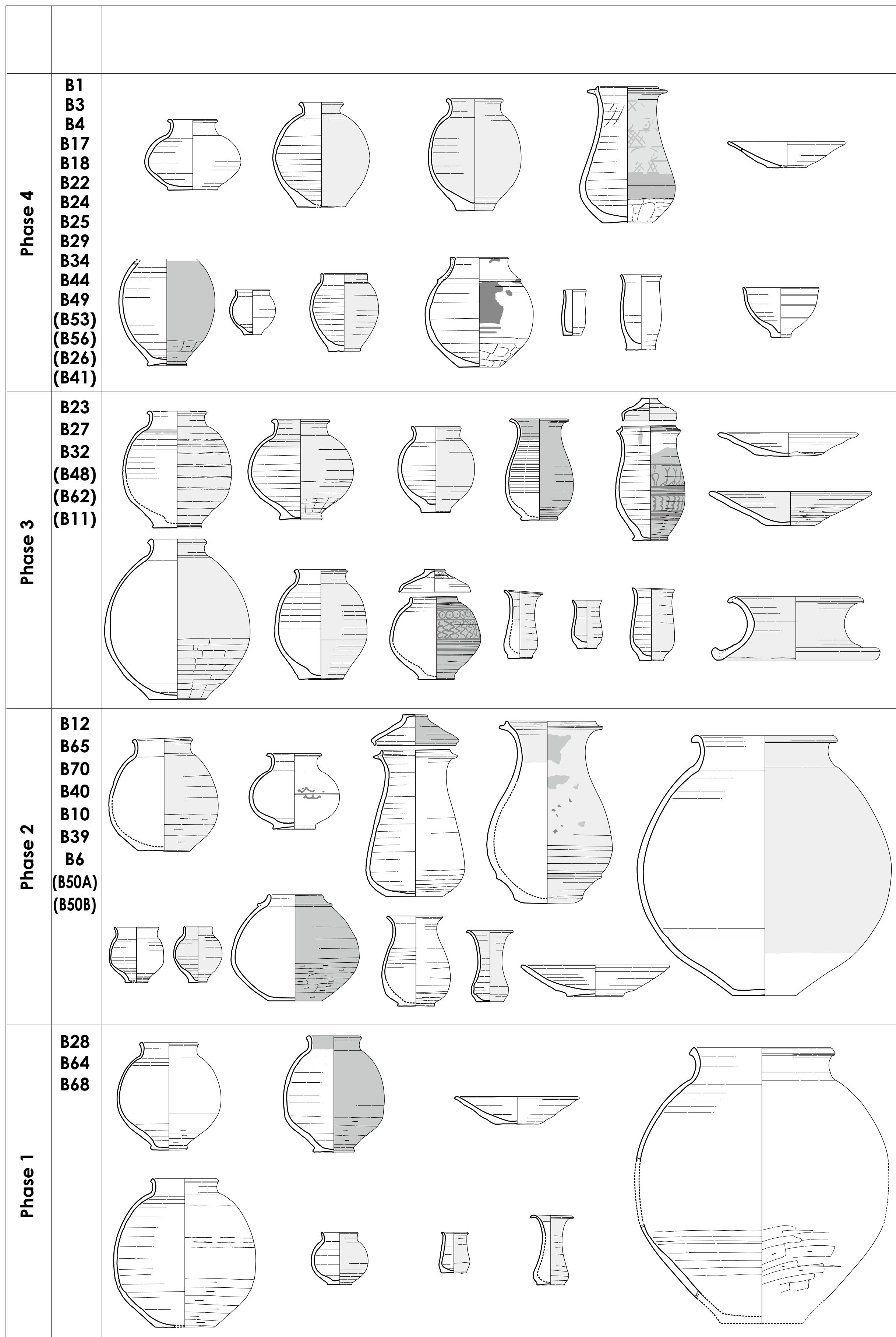


Figure 9.24 Tentative sequence of the Harappan pottery

specimens), followed by the Beakers and Dishes (39 specimens respectively), and then the Dish-on-Stands (22 specimens). Also in the case of the Non-Harappan pottery, the Pots were found in the largest number of burials in the largest number (95 specimens from 27 burials), followed by the Bowls (24 specimens from 17 specimens). These figures clearly indicate that the Pot, whether the Harappan or the Non-Harappan, is the commonest form in the burial pots.

In terms of the average number of each form in one burial, the Pot of both style is found in more than three in one burial. The Beaker also shows a high figure indicating more than two in one burial, in both the Harappan and Non-Harappan pottery. The Dish of both style and the Harappan Dish-on-Stands also tend to occur in more than one specimen in several burials.

On the contrary, it may be that those forms which were found in limited number from fewer burials were of some special nature. Although the number of painted pots are limited as a whole, those forms of a low frequency tend to be painted, e.g. Harappan Jar Type 2, Harappan Bowl-on-Stand and Non-Harappan Lid. This also suggest that they may have been given some special significance or meaning.

5.2 Relations among burials in terms of pottery

(Figure 9.24 - 9.26, Table 9.19 - 9.20)

Harappan Pot

In order to glasp the relations among burials based on the comparison of forms and shapes, first, the Harappan Pot is focused as it occurs in the largest number of burials (Figure 9.24).

The Harappan Pot Type 1A is identified in Burial nos. 10, 12, 22, 27, 32, 40, 64 and 68 in multiple specimens. Among them, Burial nos. 12, 28, 64 and 68 yield those with elliptical bodies with shallow ridges in the lower part of their bodies and disc bases. Those from Burial no. 28 are represented only by this type. In Burial no. 68, Type 1A of this type is associated with Types 1B and 1F and in Burial no. 64 Type 1B accompanies with Type 1A. This Type 1A is also found in Burial no. 32, but it occurs with Types 1C and 1D with an elongated body along with Type 1B.

Type 1A with a flat base is also found in Burial nos. 12, 28, 40 and 68 with Type 1A with a disc base, but in Burial no. 32 it is replaced by Type 1D with a flat base. This Type 1D occurs in Burial nos. 17, 18, 22 and 25, in which only Type 1D is represented or Type 1D is associated with Type 1E with an inverted elliptical shape, although small pots of Type 1A with an elliptical body make appearance in these burials.

Thus it is likely that Type 1A of a medium size in Burial nos. 28, 40, 64 and 68 and Type 1D of a medium size in Burial nos. 17, 18, 22 and 25 form two separate groups. The specimens of Pots from Burial no. 32 indicates an intermediate group having both Types 1A and 1D. Type 1D is also found in Burial nos. 24, 29, 34, 44 and 49. Burial no. 1 yields no specimen of Type 1A, but the existence of Type 1E in this burial may indicate that this burial belong to the group with Type 1D as Type 1E occurs with Type 1D in some burials.

Typologically Type 1A or the Pots with elliptical bodies is akin to the Pots or Jars of the Kot Dijian pottery in the Early Harappan period (Khan et al. 1991; Allchin et al. 1986; Halim 1972; Dani 1970-71; Mughal 1974, 1997). This type of Pots has been reported in the Harappan period at Harappa (Jenkins 1994) and at the Settlement Area of Farmana (see Chapter 6). On the other hand, the Pots or Jars with elongated bodies have been reported in the R37 cemetery at Harappa (Wheeler 1946; Jenkins 2000). According to Jenkins's works, the elongated Pots or Jars can be dated to the later phase of the R37 cemetery (Jenkins 2000). These indirect evidence indicate that the Pots with elliptical bodies can be placed in the chronological order prior to those with elongated bodies. Although further data from stratified contexts should be considered, it is assumed here that Type 1A predates Type 1D in the typological

Phase 4	B1 B3 B4 B17 B18 B22 B24 B25 B29 B34 B44 B49 (B53) (B56) (B26) (B41)	
Phase 3	B23 B27 B32 (B48) (B62) (B11)	
Phase 2	B12 B65 B70 B40 B10 B39 B6 (B50A) (B50B)	
Phase 1	B28 B64 B68	

Figure 9.25 Tentative sequence of the Harappan pottery

sequence of the Harappan Pots.

Harappan Beaker

The Harappan Beaker recur in burials next to the Harappan Pots. The Harappan Beaker can be classified into two types, i.e. Type 1 with a flaring neck and Type 2 with a straight mouth. Type 1 occurs in Burial nos. 23, 28, 40, 68 and 70, among which it is associated with the Harappan Pot Type 1A (Figure 9.24). Those from Burial no. 23 show a shape slightly different from those from the above-mentioned three burials, having a less out-curved neck, and are associated with the Harappan Pot Types 1B and 1C. In Burial no. 70, one specimen of the Harappan Beaker Type 1 occurs only with Non-Harappan forms.

The Beaker Type 2 is found in Burial nos. 1, 12, 18, 22, 23, 28, 29, 32, 44 and 64 showing a concurrence with the Harappan Pot Types 1D and 1E in several burials. Those from Burial nos. 12 and 64 are distinctly short in height in comparison to those from other burials. Burial nos. 23, 28 and 32 include specimens with wide mouths. Those from Burial nos. 1, 18, 22 and 44 are slender in shape.

Thus the Harappan Beaker Type 1 and Type 2 with a short profile is associated with the Harappan Pot Type 1A in three burials and with the Harappan Pot Type 1B in one burial, and the Harappan Beaker Type 2 with a slender body is associated with the Harappan Pot Types 1D and 1E. The Harappan Beaker Type 2 with a wide mouth is found with the Harappan Pot Types 1a and Type 1D. These concurrences indicate that the correlation between the Harappan Pot Types and the Harappan Beaker Types are quite clear.

5.3 Tentative evaluation of sequential order of burials

(Figures 9.24 - 9.26)

Based on the tentative identification of correlation between the Harappan Pot Types and Beaker Types, the sequential order of burials are discussed in this section.

Two distinct groups can be identified on the basis of the Harappan Pot Types and Beaker Types, as discussed above. The first group is represented by Burial nos. 28, 64 and 68 and the second group is comprised by Burial nos. 17, 18, 22 and 25. Burial no. B40 is closer to the first group in terms of its assemblage and features, with some differences. Burial nos. 1, 24, 29, 34, 44 and 49 can be included in the second group by the occurrence of the Harappan Pot Types 1D and 1E. Burial 32 may form another group sharing traits both from the first and second groups. Thus four groups are tentatively proposed here.

Group 1 Burial nos. 28, 64 and 68
Group 2 Burial no. 40
Group 3 Burial no. 32
Group 4 Burial nos. 1, 17, 18, 22, 24, 25, 29, 34, 44 and 49

One specimen of the Harappan Pot Type 1A from Burial nos. 27, associated with the Harappan Pot Type 1C, is less bulging in shape and the postion of BD is slightly higher than those from BUrial nos. 28, 64 and 68. A small Pot (B27 P9) is identical in shape to one specimen from Burial no. 49 (P8), having a higher position of BD in comparison to small pots in Burial no. 64 which clearly have the lower centre of gravity. One specimen of the Harappan Pot of Type 1C (B27 P8-2) shows formal features identical to one specimen in Burial no. 32 (P3). These observations indicate that Burial no. 27 may postdate Burial no.68 and may be closer to Burial nos. 32 and 40 in the sequential order.

In Burial no. 39, the Harappan Pots are limited in number, with only one specimen of Type 1B (P8). The Harappan Pot Type 3A or a Flanged Pot (B39 P7) is distinguished by an elliptical body with a lower centre of gravity and a salient flange showing clear formal differences from that in Burial no. 32 (B32 P14). Typologically B39 P7 can be considered as

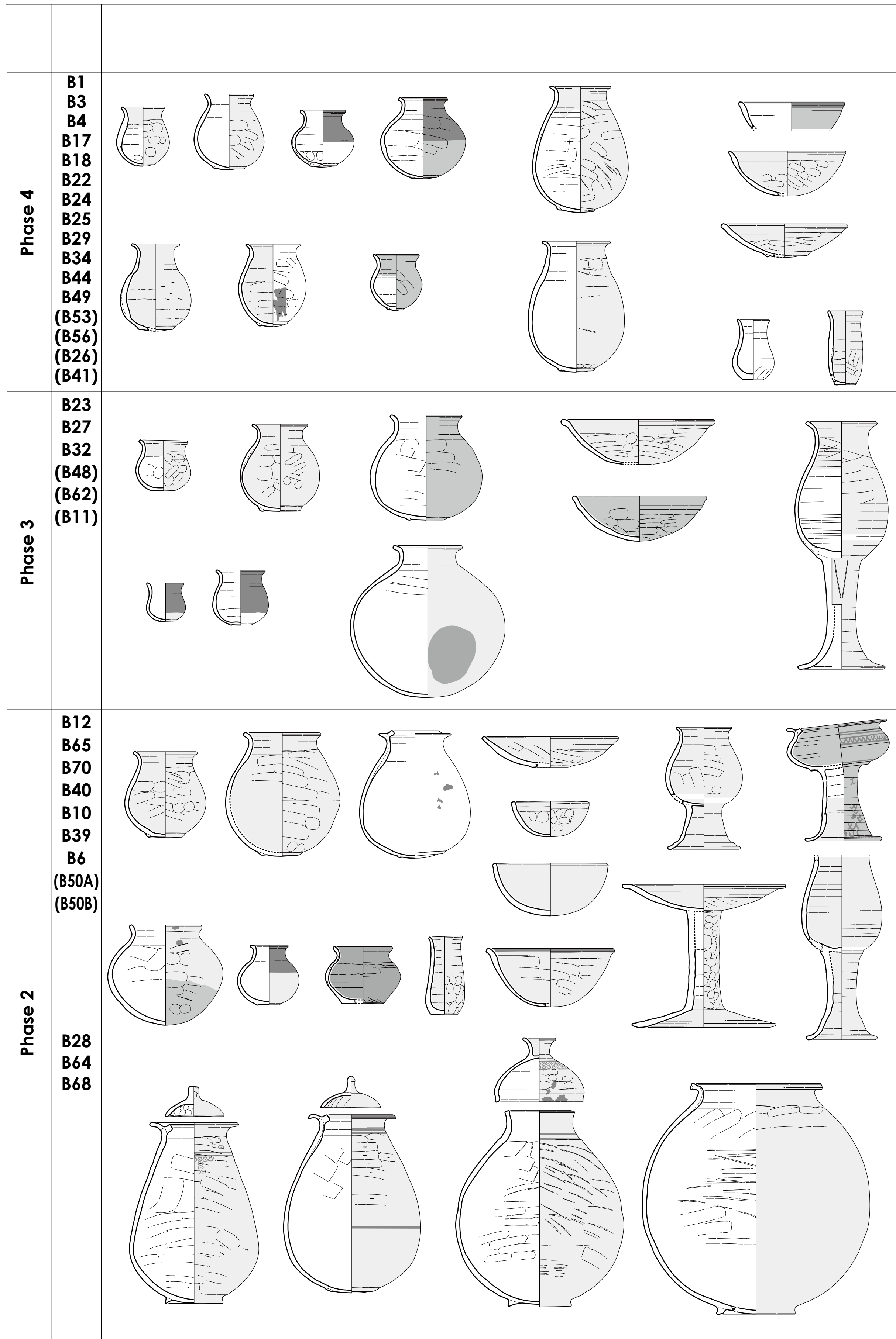


Figure 9.26 Tentative sequence of the Non-Harappan pottery

predating B32 P14. Thus Burial no. 39 can be placed earlier than Burial no. 32 in the sequential order, although the sequential relation with Burial nos 28, 64 and 68 cannot be determined.

Also in Burial no. 6, one specimen of Type 3A is found which shows the same formal features as that of Burial no. 39. In addition, this burial bears a number of traits common to Burial no. 39, such as Pot Type 1F, Jar Type 2 with Lid Type1 and Bowl-on-Stand Type 1 of the Harappan forms indicating a contemporaneity with Burial no. 39. One specimen of the Harappan Jar Type 2 (B6 P2) shows formal features different from that in Burial no. 32 (P1) showing a sequential priority of this specimen to that of Burial no. 32. The Harappan Lid Type in Burial nos. 6 and 39 different from those in Burial no. 32 also corroborates this identification.

Burial no. 12 yields the Harappan Pot Type 1A, among which one specimen of mediaum size (P12) looks similar to those in Burial no. 68 but it is more elongated in shape and a small pot (P8) shows a globular shape. These features may suggest that Burial no. 12 is slightly later than Burial nos. 28, 64 and 68 and closer to Burial no. 40 in the sequential order. Specimens of the Harappan Beaker Type 2 are distinguished by its short profile showing a similarity to those from Burial no. 64.

Burial no. 65 is conspicuous by the absence of the Harappan pottery. However, the formal assemblage and features of the Non-Harappan pottery in this burial exhibit a close similarity to those of Burial no. 12, such as Pot Types 1 and 6, Beaker Type 2, Jar Type 2 with a lid, Dish-on-Stand and Pot-on-Stand Type 2. This similarity indicates a close relation between Burial nos. 65 and 12. Burial no. 70 also attests to a similar assemblage indicating an assignation to the same chronological group. One specimen of the Harappan Beaker Type 1 (P9) may also point to this sequential position of this burial which is relatively older in the sequential position.

In Burial nos. 48 and 50B, Harappan Dish-on-Stands were found. These specimens are distinguished by their out-curved pedestal rims, showing a similarity to those from Burial nos. 39, 40 and 68.

Burial 50A has one specimen of the Harappan Jar Type 2A which is distinguished by a lower centre of gravity. In this sense, this specimen is closer to those from Burial nos. 6 and 39. It is also relevant that one specimen of the Non-Harappan Pot-on-Stand (P14) is distinguished by the same feature as that of Burial nos. 27 and 39. These observations suggest that Burial no. 50A may be placed in a sequential position closer to Burial nos. 6, 27 and 39.

Two specimens of small pots of the Harappan Pot Type 1A were found in Burial no. 10. These specimens which clearly have elliptical body with a lower centre of gravity may be comparable with those from Burial no. 64. In the Non-Harappan forms, the specimens of Bowls are distinguished by a simple neck and rim slightly out-curved. This type of Bowls is also found in Burial no. 8 indicating a possibility of their contemporaneity.

Burial no. 11 yields one specimen of the Harappan Pot 1B or 1E and a pedestal fragment of a Dish-on-Stand with an out-curved rim. These may place this burial in a position closer to Burial no. 32.

Burial no. 20 is partially destroyed by a later burial (Burial no. 19) in its upper part where burial pots might have been placed. Probably due to this reason, only two fragments of pottery were found in this burial. One of them is a bowl fragment of a Bowl-on-Stand Type 2 which may be comparable with one specimen from Burial no. 68.

In Burial no. 26 three specimens of pottery were found, one of which represents the Harappan Pot Type 1E.

Only fragments were unearthed from Burial no. 33 consisting of one specimen of a Dish-on-Stand, one specimen of a Pot and two specimens of Bowls, all of the Non-Harappan forms. Among them, the Dish-on-Stand (2-1) can be comparable with that from Burial no. 70 (P7).

Burial no. 44 yields one specimen of the Harappan Beaker Type 2 with a slender profile which

may indicate its contemporaneity with Burial no. 1, 18, 29, etc.

Burial nos. 48 and 56 are distinguished by the predominance of the Non-Harappan pottery, but one specimen of the Harappan Dish-on-Stand is found respectively from these burials. The one in Burial no. 48 has an out-curved pedestal rim which may point to a sequential position closer to Burial no. 32. The one in Burial no. 56 has a simple rim which exhibit no comparable specimens in other burials.

Burial no. 53 yields one specimen of the Harappan Dish-on-Stand having a simple pedestal rim which may indicate its similarity to that from Burial no. 18 (1).

Also in Burial no. 54, one specimen of the Harappan Dish-on-Stand is attested (1). This specimen is distinguished by an out-curved pedestal rim with a ledge on its lower side. This pedestal rim may be comparable with that of B68 (P9). One specimen of the Harappan Pot has a elliptical body. These features may indicate that this burial can be placed closer to Burial no. 68.

The following burials are conspicuous by the limited number of pottery, poor preservation or the absence of the Harappan pottery which may help us to assume their sequential position: Burial nos. 15, 16, 38, 41, 52, 66 and 67

5.4 Case of overlapping burials
(Figure 9.27 - 9.31)

Five examples of overlap of different burials were attested in the excavations. These example can help us to determine the sequential order of ceramic assemblage, forms and finally the burials.

[Burial nos. 53 and 54]

In this case, Burial no. 53 postdates Burial no. 54 (Figure 9.27). Comparing specimens of the Harappan Dish-on-Stands from these two burials, their pedestal rims are clearly different in shapes. That is, B54- P1 is distinguished by its out-curved pedestal rim with a ledge on its lower side whereas B53 P2 exhibit a simple pedestal rim. The overlap relation between these two burials clearly indicates that the former pedestal rim type is earlier than the latter.

[Burial nos. 50A and 50B]

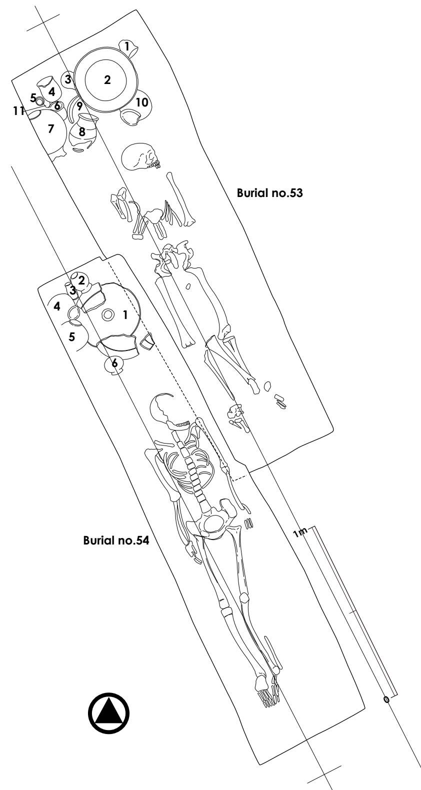
Burial 50B cuts into Burial 50A, showing that the former is posterior to the latter (Figure 9.28). As discussed above, Burial no.50A may be placed closer to Burial nos. 6 and 39 based on the occurrence of the Harappan Jar Type 2A and the Non-Harappan Pot-on-Stand Type 1. On the other hand Burial no. 50B has a Dish-on-Stand with an out-curved pedestal rim with a ledge which may indicate its similarity to those of Burial nos. 54 and 68. That is, this burial also may also be placed in earlier position of the sequential order. The occurrence of the Harappan Pot Type 1F or a large-sized Pot suggest its similarity to Burial nos. 12, 39 and 68.

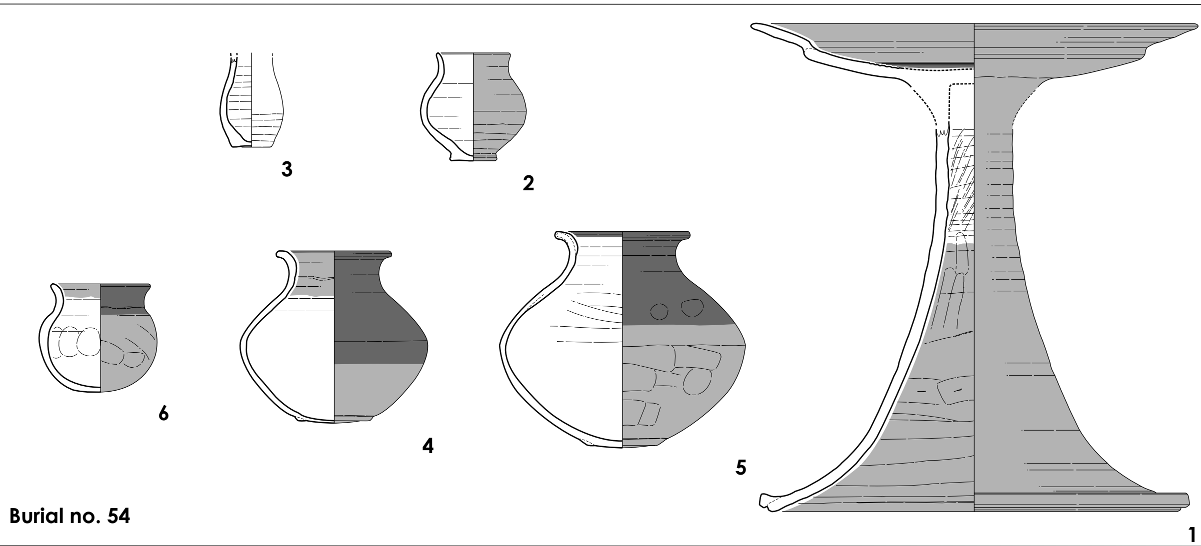
[Burial nos. 18, 19, 20 and 21]

In this example, only Burial nos. 18 and 20 yield pottery (Figure 9.29). Burial no. 18 is older than Burial no. 18. While Burial no. 20 has one specimen of the Harappan Bowl-on-Stand Type 2, Burial no. 18 is distinguished by the Harappan Pot Types 1D and 1E, the Harappan Beaker Type 2 of a slender profile and the Harappan Dish-on-Stand Type 1 with a simple rim.

[Burial nos. 22 and 23]

In this case, Burial no. 22 is later than Burial no. 23 (Figure 9.30). While Burial no. 22 is distinguished by the Harappan Pot Type 1C and the Harappan Beaker Type 2 with a slender profile, Burial no. 23 includes the Harappan Beaker Type 1 and Type 2 with a wide mouth. The Harappan Pots are definitely different from those in Burial nos. 28, 64 and 68, and relatively globular compared to the Harappan Pot Type 1D in Burial no. 22. These evidence indicate that Burial no. 23 exhibit ceramic features older than





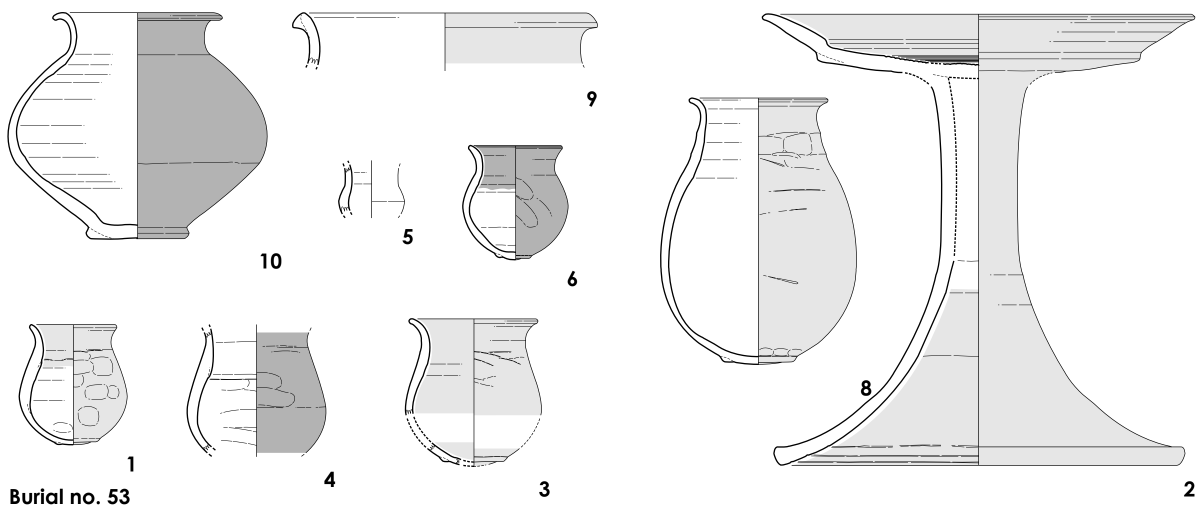
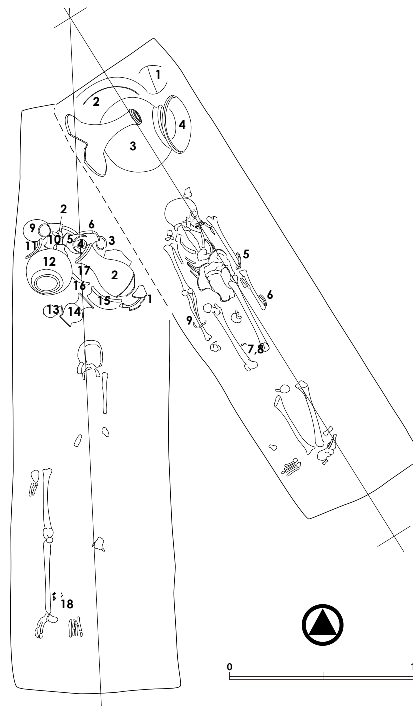
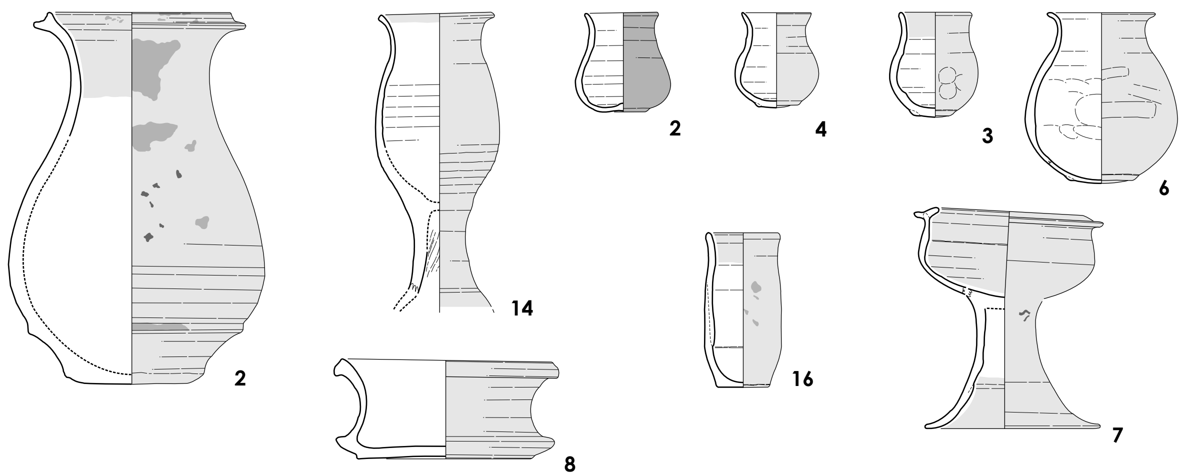


Figure 9.27 Burial nos. 53 and 54





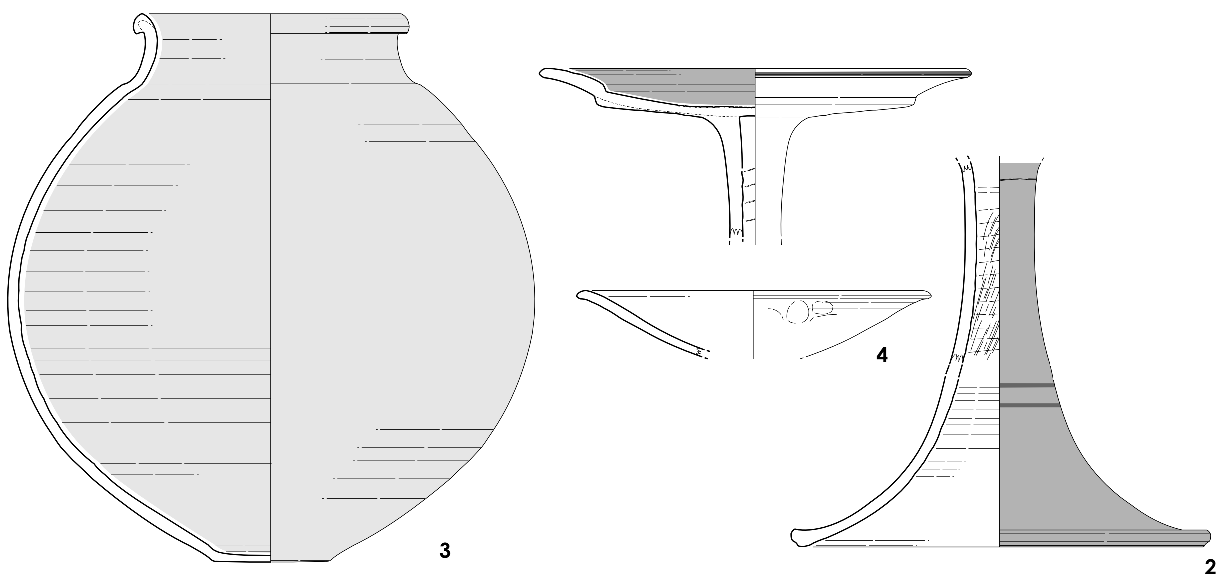
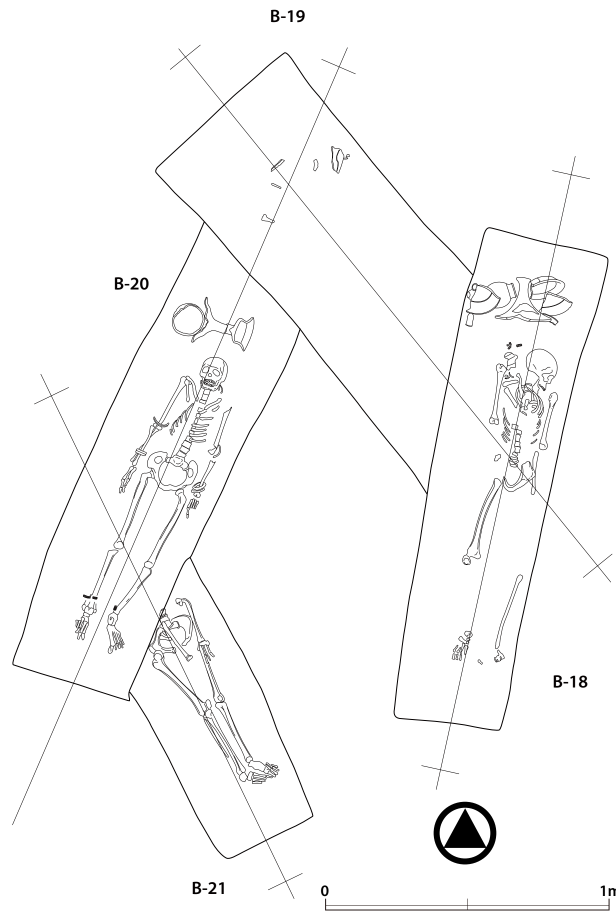
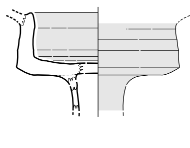
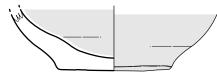


Figure 9.28 Burial nos. 50A and 50B



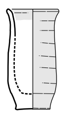


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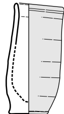


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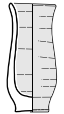
Burial no. 20



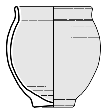
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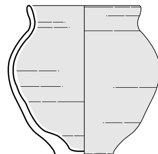
4



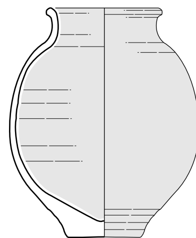
5



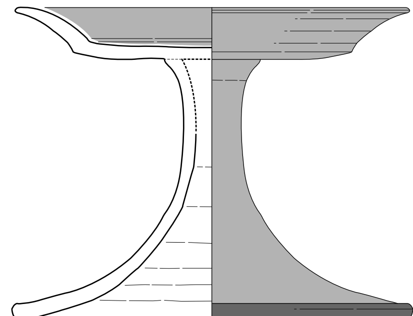
no number-2



no number-1



2



1

Burial no. 18

Figure 9.29 Burial nos. 18, 19, 20 and 21

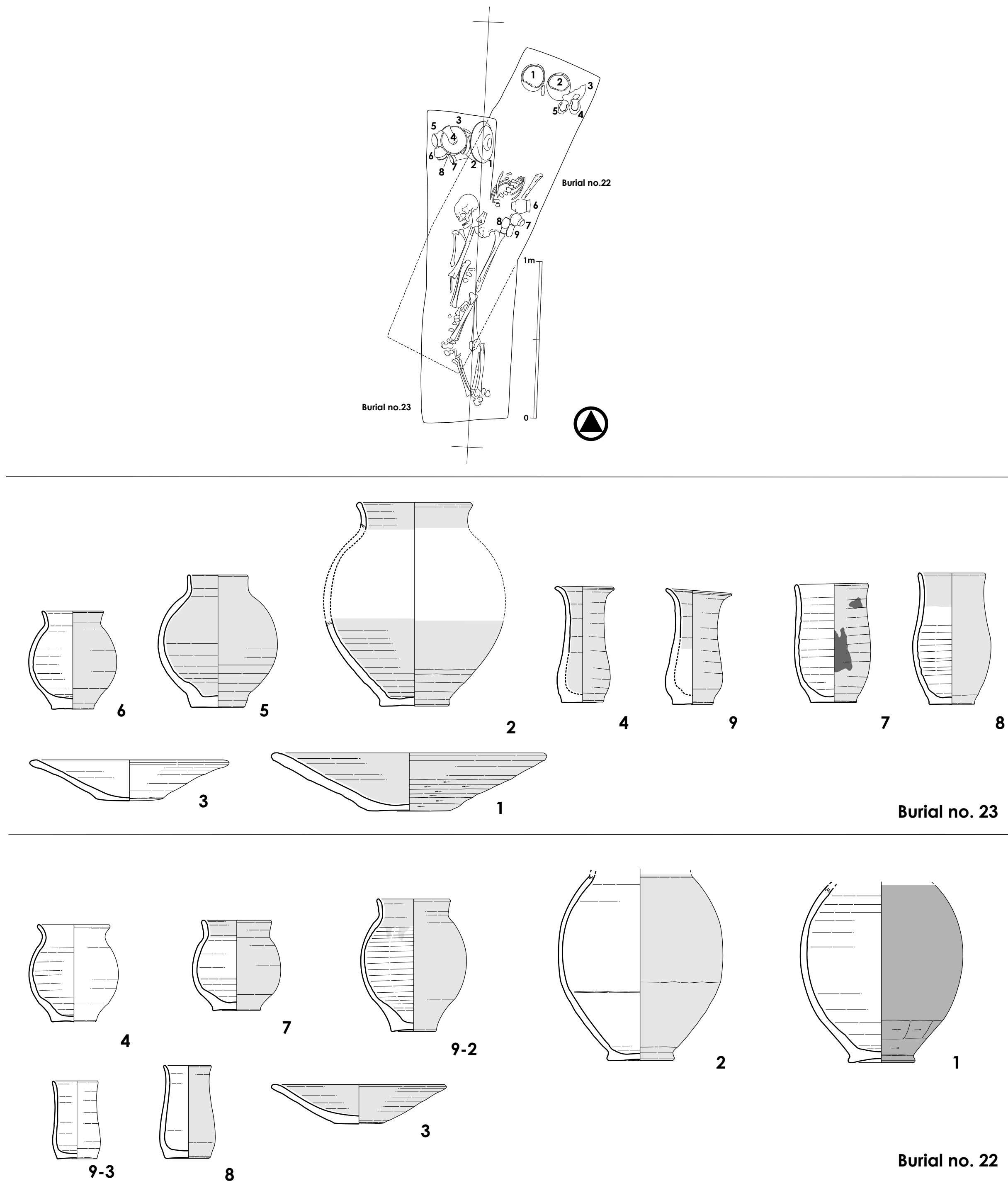


Figure 9.30 Burial nos. 22 and 23

Burial no. 22 and later than Burial nos. 28, 48 and 68.

[Burial nos. 40 and 41]

Burial no. 40 is earlier than Burial no. 41 in this case of overlapping (Figure 9.31). Burial no. 40 yields a number of the Harappan pottery which indicate its position closer to Burial no. 28, 64 and 68. In contrast, Burial no. 41 is conspicuous by the absence of the Harappan pottery. Thus it is difficult to compare the pottery from these burials, although the sequential relations between these two burials are obvious.

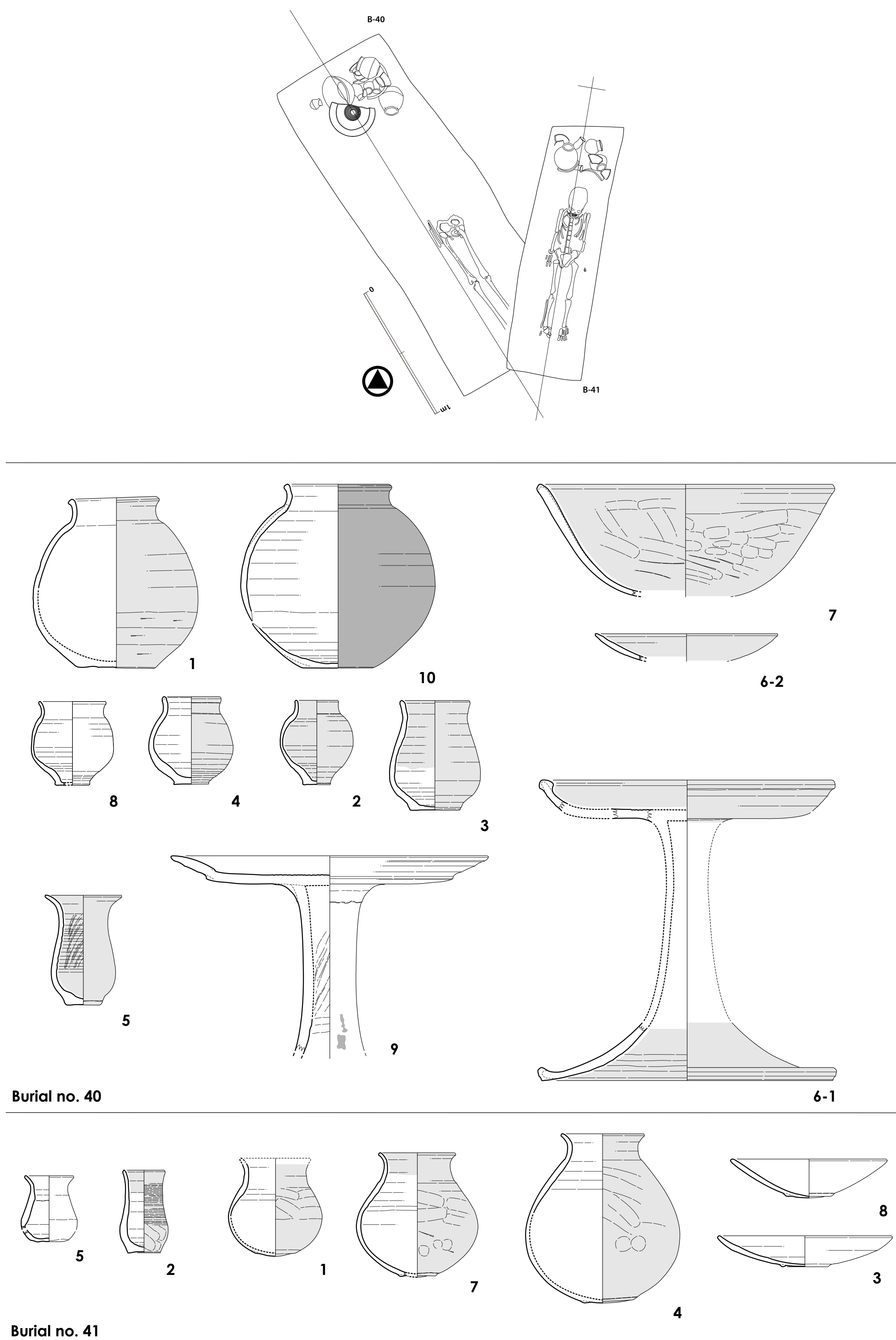


Figure 9.31 Burial nos. 40 and 41

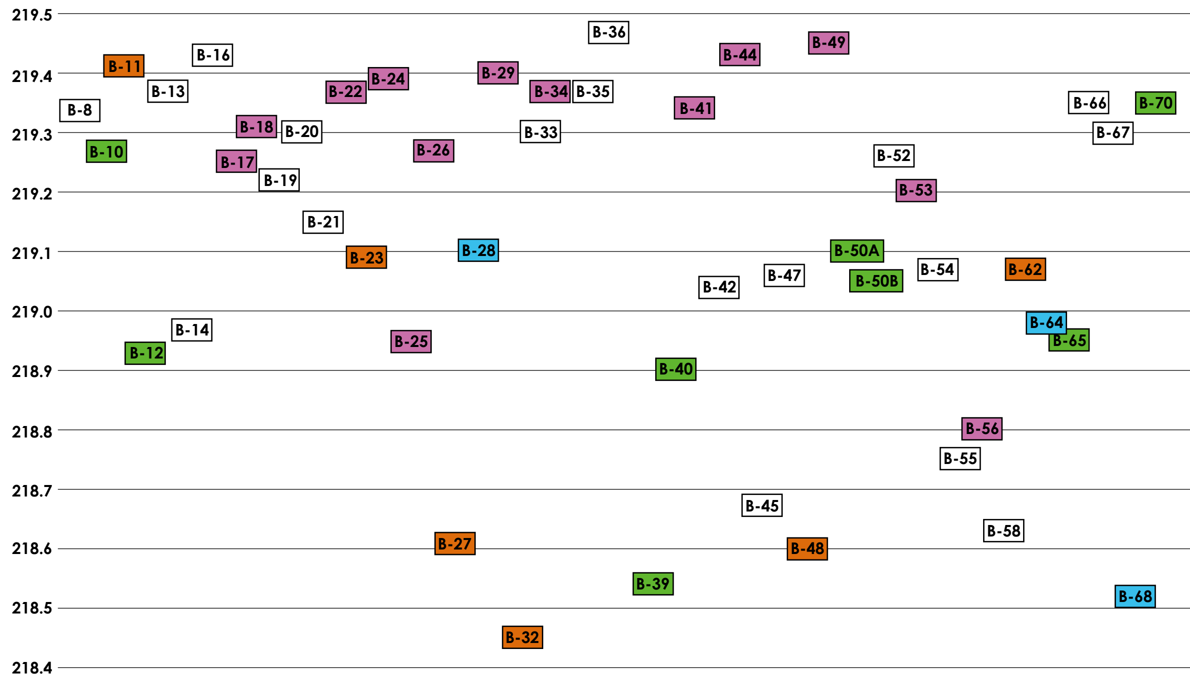


Figure 9.32 Depth of the bottom of burial pits

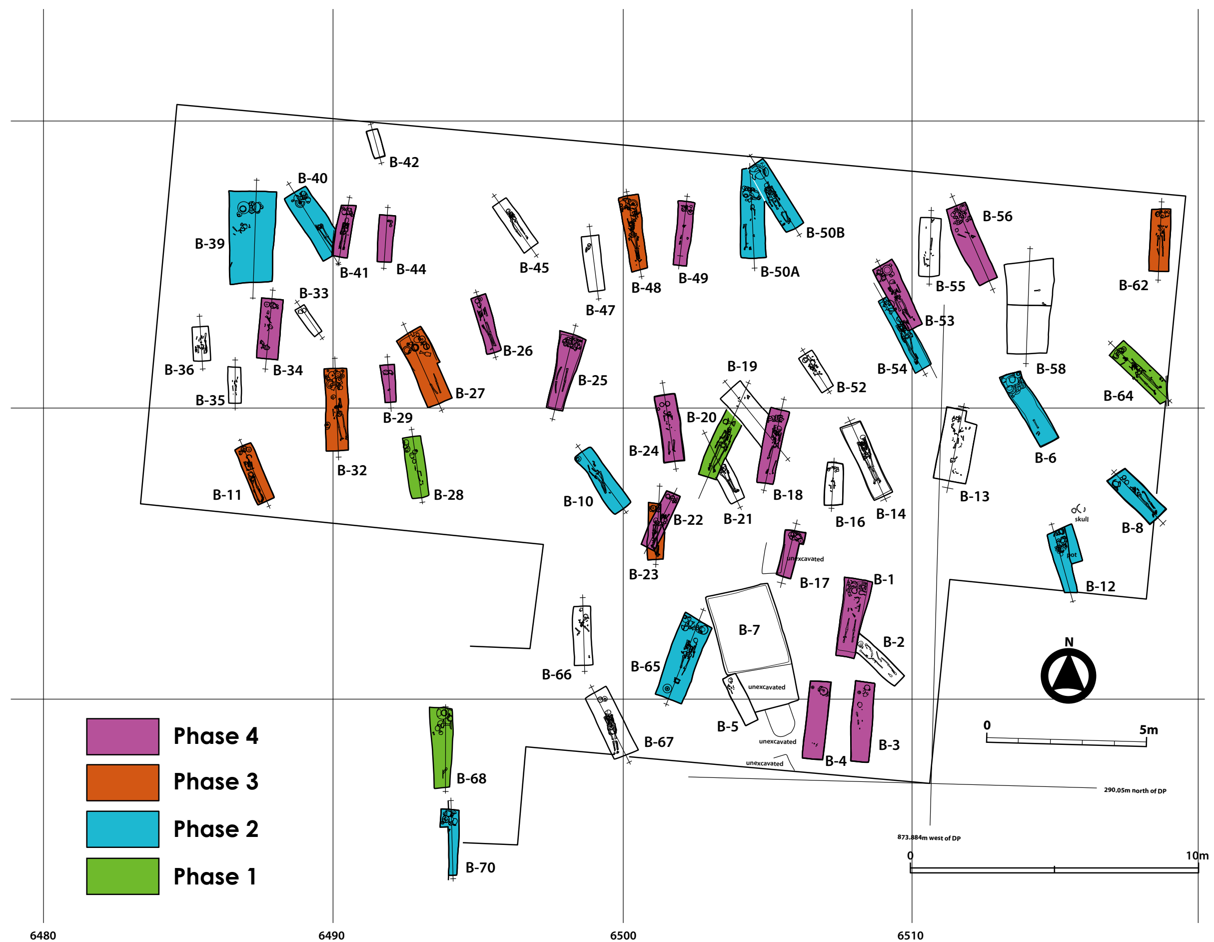


Figure 9.33 Phase-wise distribution of burials

6 CONCLUSION FOR BURIAL POTTERY

Based on the discussion above, four phases are proposed in the sequential order of the burial pottery in order to understand the chronological change of the burial pottery through time. Clear differences can be observed between Phase 1 and Phase 4, with intermediate phases of Phases 2 and 3.

Figure 9.32 shows the depth of each burial pit showing no clear relation between the depth of burial pits and phases. Figure 9.33 indicates spatial distribution of burials in each phase.

Phase 1

Three burials (Burial nos. 28, 64 and 68) are tentatively placed in this phase which represents the oldest phase in the cemetery. These burials are distinguished by the absence of the Non-Harappan pottery. Type 1A with an lower-centred elliptical body, Type 1B of a globular body and Type 1F or a large-sized pot, of the Harappan Pot, Type 1 with a flaring neck and Type 2 with a short profile of the Harappan Beaker, the Harappan Dish-on-Stand Type 1 with an out-curved rim with a ledge, the Harappan Bowl-on-Stand Type 2 and the Dish comprise the assemblage of this phase.

Phase 2

Burial nos. 6, 10, 12, 39, 40, 65 and 70 are included in this phase. While the Harappan Pot Type 1A which is similar to that of Phase 1 can be ascertained in this phase, Type 1A with a upper centre of gravity and Type 1B which are absent in Phase 1 are attested

The Harappan Pot Type 3, the Harappan Jar Types 1 and 2A are distinguished by their body shape with a lower centre of gravity. The Dish and the Harappan Pot Type 1F shows the same feature as that of Phase 1. The Harappan Bowl -on-Stand Type 1 makes appearance. The Harappan Dish-on-Stand is distinguished by its pedestal rim out-curved.

Among the Non-Harappan pottery, Pot Types 1, 2, 3 and 4, Beaker, Dish, Bowl and Pot-on-Stands Types 1 and 2, Pedestalled Bowl, Dish-on-Stand are attested. It is noteworthy that there are some forms which may represent an imitation of the Harappan pottery, such as Flanged Pot, Dish-on-Stand and Dish.

Phase 3

In the Harappan pottery, Pot Type 1D makes appearance in this phase while Pot Type 1A is still attested. In the specimen of Pot Type 3 or Flanged Jar, the BD is positioned higher than those in Phase 2. Jar Type 2 is also distinguished by the higher positon of gravity and the slender body, whereas Jar Type 1 shows the same feature as that of Phase 2. In the Beaker, Type 2 of a slender profile makes its appearance whereas Type 1 still occurs. The Dish shows no change in shape from those in Phases 1 and 2.

In the Non-Harappan pottery, the Pot Type 1 is dominant showing no clear change from those of Phase 2. The specimen of the Pot-on-Stand Type 1 of the same shape as that of Phase 2 is found in this phase.

Phase 4

In the Harappan pottery, a tendency towards tall and slender body shapes is clearly ascertained, although some older types are still existent in a limited number. The Bowl with hemispherical shapes were found only in this phase. The Dish exhibits o change from the preceding phases.

In the Non-Harappan pottery, Pot Types 1, 7 and 8 make occurrence. It may be that the Pot Type 7 and 8 indicate a tendency towards tall and slender shapes commonly attested in the Harappan pottery in this phase. In Jars, Type 1 is found having a tall shape, although a similar shape is attested in Phase 2 as well. In addition to these, the Bowl, Dish and Beaker are

Table 9.19 Number of specimens of each Harappan type in each burial

Burial no.	Total	Harappan																																		
			Pot											Jar					Bowl				Beaker			Dish	DoS			BoS			PoS	Lid		
		Total	Total	1A	1B	1C	1D	1E	1F	2	3A	3B	3C	Total	1	2A	2B	2C	Total	1	2	3	Total	1	2	Total	Total	1	2	Total	1	2	Total	Total	1	2
B-001	23	23	9	1	0	1	0	5	0	1	0	1	0	1	0	1	0	0	2	0	0	2	5	0	5	3	2	1	0	1	1	0	0	0	0	0
B-002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-003	3	3	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
B-004	7	6	3	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0
B-005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-006	16	15	3	0	1	0	0	0	1	0	1	0	0	3	2	1	0	0	0	0	0	0	0	0	0	4	2	0	0	1	1	0	1	1	1	0
B-008	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
B-010	9	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-011	4	3	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
B-012	27	8	5	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	0	0	0	0	0	0	0	0	0
B-013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-015	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-016	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-017	9	7	4	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
B-018	7	7	3	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	1	1	0	0	0	0	0	0	0	0
B-019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-020	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
B-021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-022	10	10	7	1	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	0	0	0	0	0	0	0	0	0
B-023	9	9	3	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	2	2	0	0	0	0	0	0	0	0	0	0
B-024	4	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-025	16	8	5	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0
B-026	2	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-027	11	9	3	2	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	3	1	1	1	1	0	0	0	0	0
B-028	8	8	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	0	0	0	0	0	0	0	0	0	0
B-029	8	8	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	4	1	0	0	0	0	0	0	0	0	0	0
B-032	26	21	8	2	2	1	1	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	5	0	5	3	1	1	0	1	1	0	0	2	0	2
B-033	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-034	9	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Burial no.	Total	Harappan																																			
			Pot											Jar					Bowl				Beaker			Dish	DoS			BoS			PoS	Lid		
		Total	Total	1A	1B	1C	1D	1E	1F	2	3A	3B	3C	Total	1	2A	2B	2C	Total	1	2	3	Total	1	2	Total	Total	1	2	Total	1	2	Total	Total	1	2
B-038	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-039	16	10	3	0	1	0	0	0	1	0	1	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	3	3	0
B-040	12	11	7	4	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	2	1	1	0	0	0	0	0	0	0
B-041	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
B-042	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-044	4	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
B-045	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-047	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-048	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
B-049	10	9	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	4	0	0	0	0	0	0	0	0	0	0
B-050A	21	6	3	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
B-050B	5	4	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0
B-052	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-053	10	3	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
B-054	6	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0
B-055	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-056	13	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
B-058	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-062	8	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
B-064	13	12	8	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2	0	0	0	0	0	0	0	0	0	0
B-065	22	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
B-066	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-067	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-068	12	12	7	4	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	1	1	1	0	1	0	1	0	0	0	0
B-070	15	3	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Total	459	261	121	33	15	8	11	14	5	3	2	1	1	10	4	3	1	1	5	2	1	2	45	8	35	39	24	13	2	7	5	2	1	7	4	2

Table 9.20 Number of specimens of each Non-Harappan type in each burial

Burial no.	Total	Non-Harappan																																		
			Pot									Jar			P. Pot			Bowl					P. Bowl			Beaker			Dish			DoS	Lid			GW Pot
		Total	Total	1	2	3	4	5	6	7	8	Total	1	2	Total	1	2	Total	1	2	3	4	Total	1	2	Total	1	2	Total	1	2	Total	Total	1	2	Total
Total	459	198	110	50	1	1	7	1	12	1	10	7	0	0	10	3	7	25	1	16	7	1	5	3	1	18	10	8	15	13	1	5	4	3	1	1
B-001	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-003	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-004	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-006	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
B-008	6	4	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-010	9	6	3	0	0	0	2	0	1	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
B-011	4	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-012	27	19	6	4	0	0	0	0	1	0	1	1	0	1	1	0	1	0	0	0	0	0	1	1	0	6	3	3	1	1	0	1	2	2	0	0
B-013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-015	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-016	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-017	9	2	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
B-018	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-020	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-022	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-023	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-024	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-025	16	8	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	2	0	0	0	0	0	0
B-026	2	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-027	11	2	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-028	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-029	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-032	26	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
B-033	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-034	9	8	4	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3	2	0	0	0	0	0	0
B-035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Burial no.	Total	Non-Harappan																																		
			Pot									Jar			P. Pot			Bowl					P. Bowl			Beaker			Dish			DoS	Lid			GW Pot
		Total	Total	1	2	3	4	5	6	7	8	Total	1	2	Total	1	2	Total	1	2	3	4	Total	1	2	Total	1	2	Total	1	2	Total	Total	1	2	Total
B-036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-038	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
B-039	16	6	3	2	0	0	1	0	0	0	0	0	0	0	1	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-040	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-041	8	7	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	0	0	0	0	0	0
B-042	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-044	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-045	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-047	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-048	10	9	8	7	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-049	10	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-050A	21	15	8	7	0	0	0	0	0	0	1	0	0	0	1	1	0	1	0	0	1	0	2	1	0	1	1	0	2	2	0	0	0	0	0	0
B-050B	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
B-052	6	6	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-053	10	7	6	3	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-054	6	3	3	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-055	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-056	13	12	8	0	0	0	1	0	0	1	5	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0
B-058	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-062	8	6	3	1	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
B-064	13	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-065	22	20	10	6	1	0	0	1	1	0	0	1	0	1	2	0	2	0	0	0	0	0	0	0	0	4	1	3	0	0	0	1	2	1	1	0
B-066	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-067	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-068	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B-070	15	12	8	6	0	1	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0
Surface	42	22	15	0	0	0	0	0	0	0	2	2	0	0	2	0	2	1	0	1	0	0	1	1	0	3	2	1	0	0	0	0	0	0	0	0
Total	459	198	110	50	1	1	7	1	12	1	10	7	2	2	10	3	7	25	1	16	7	1	5	3	1	18	10	8	15	13	1	5	4	3	1	1

found showing no change from those of the preceding phases.

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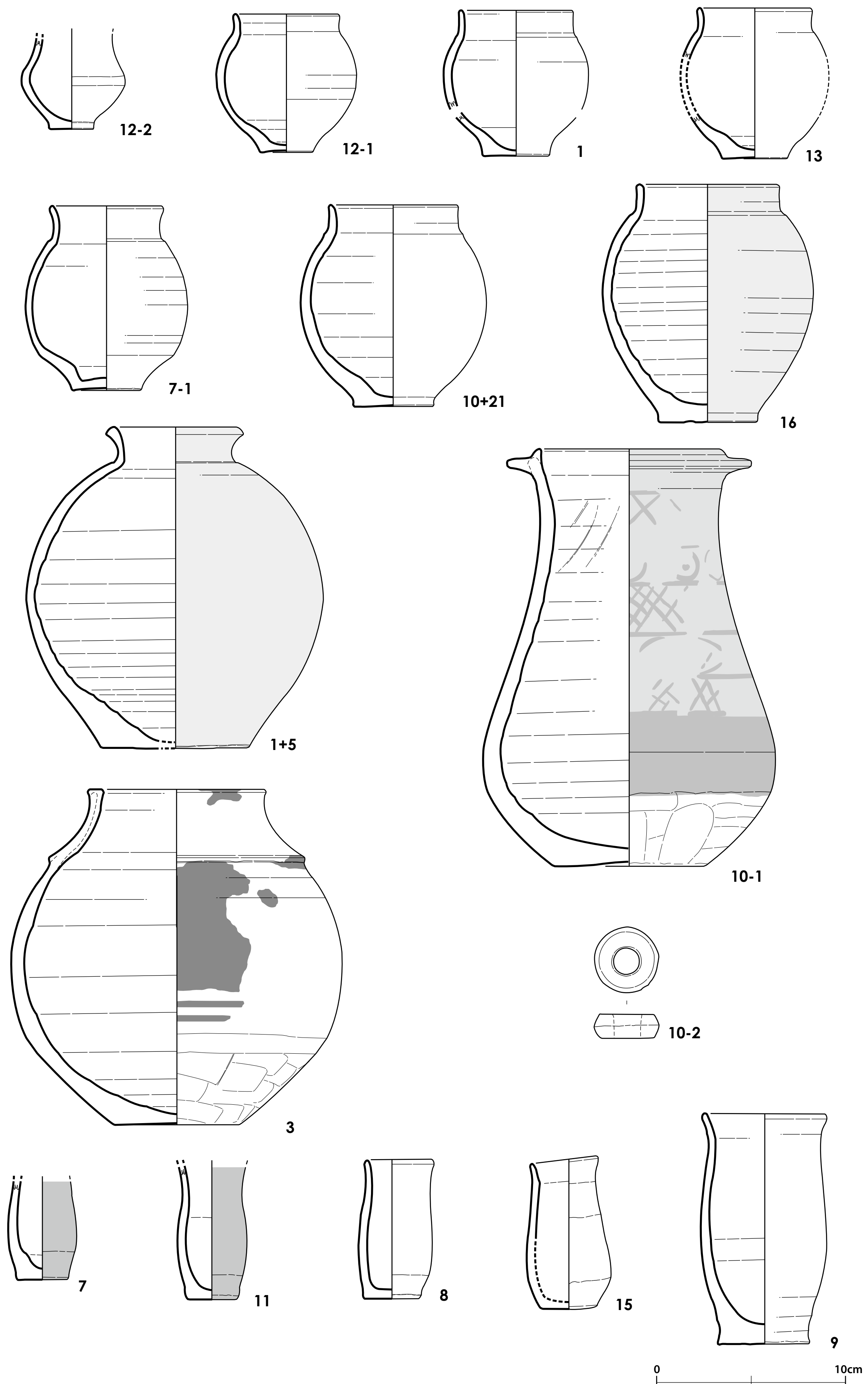


Figure 9.34 Pottery from Burial no.1 (1:3)

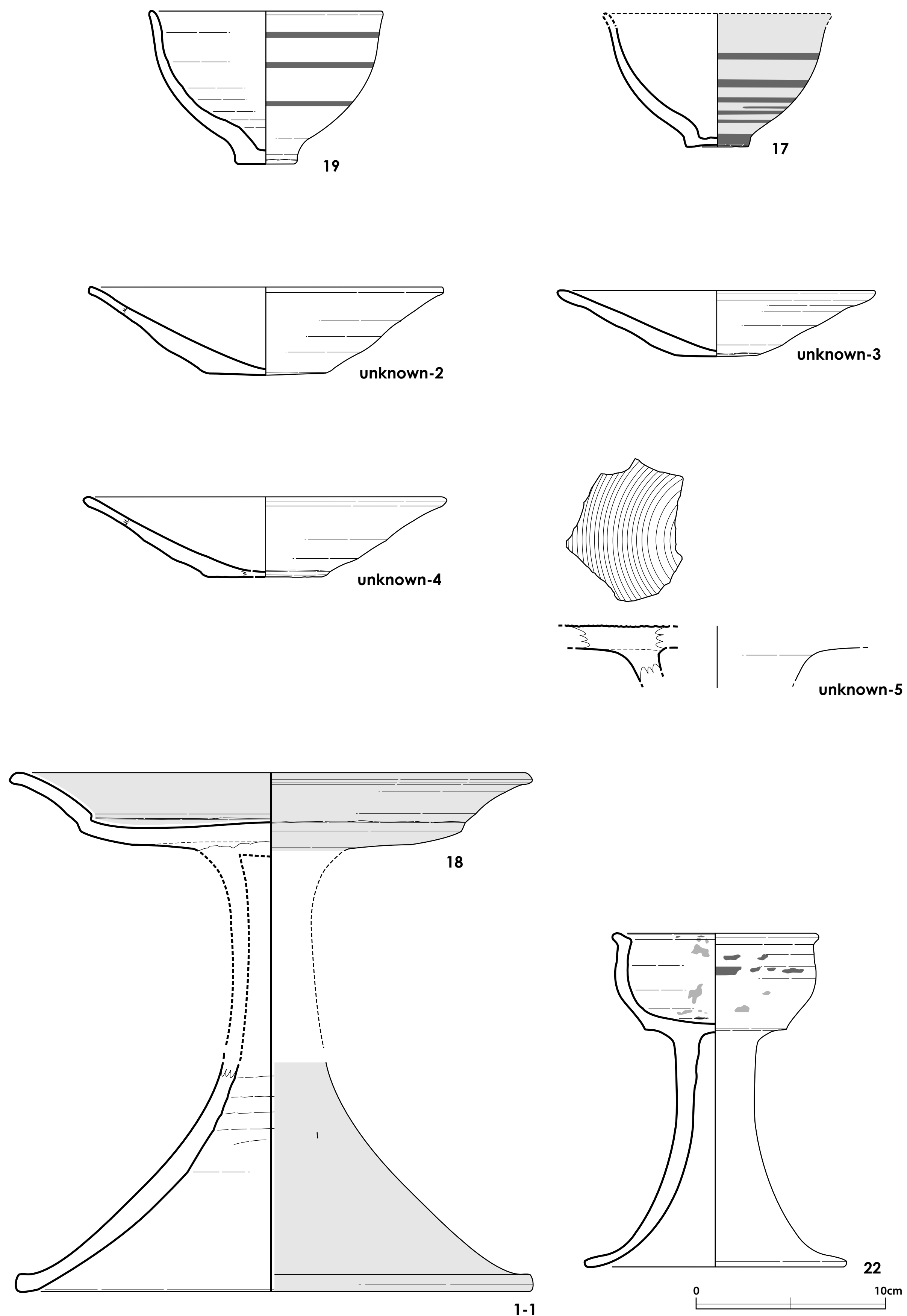


Figure 9.35 Pottery from Burial no.1 (1:3)



Figure 9.36 Pottery from Burial no.1

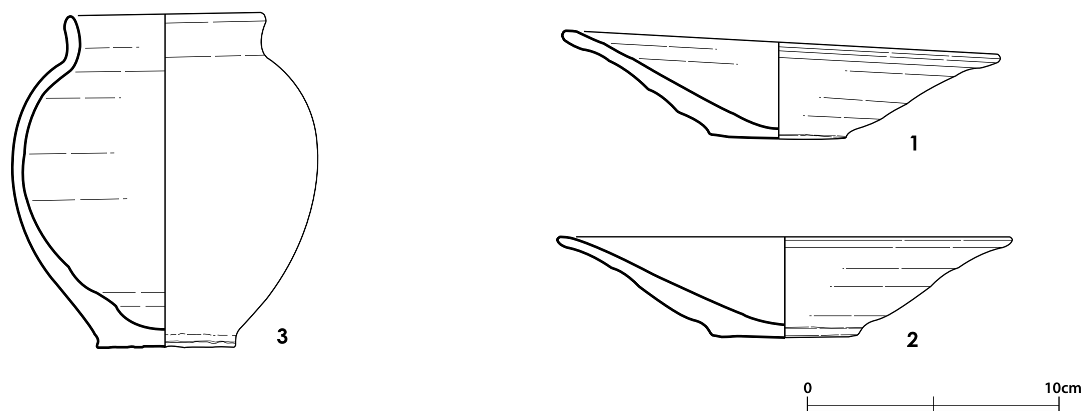


Figure 9.37 Pottery from Burial no.3 (1:3)

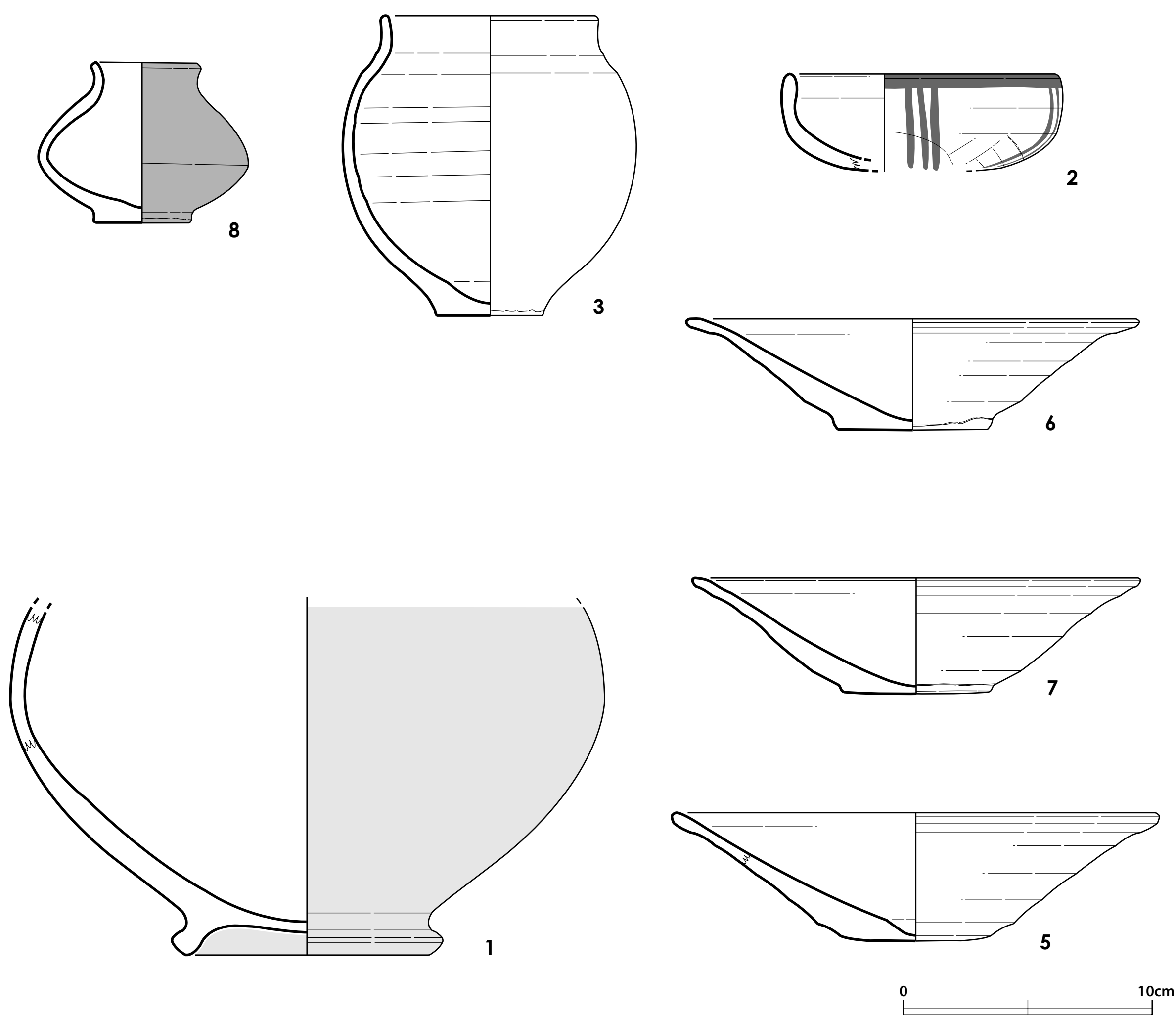


Figure 9.38 Pottery from Burial no.4 (1:3)

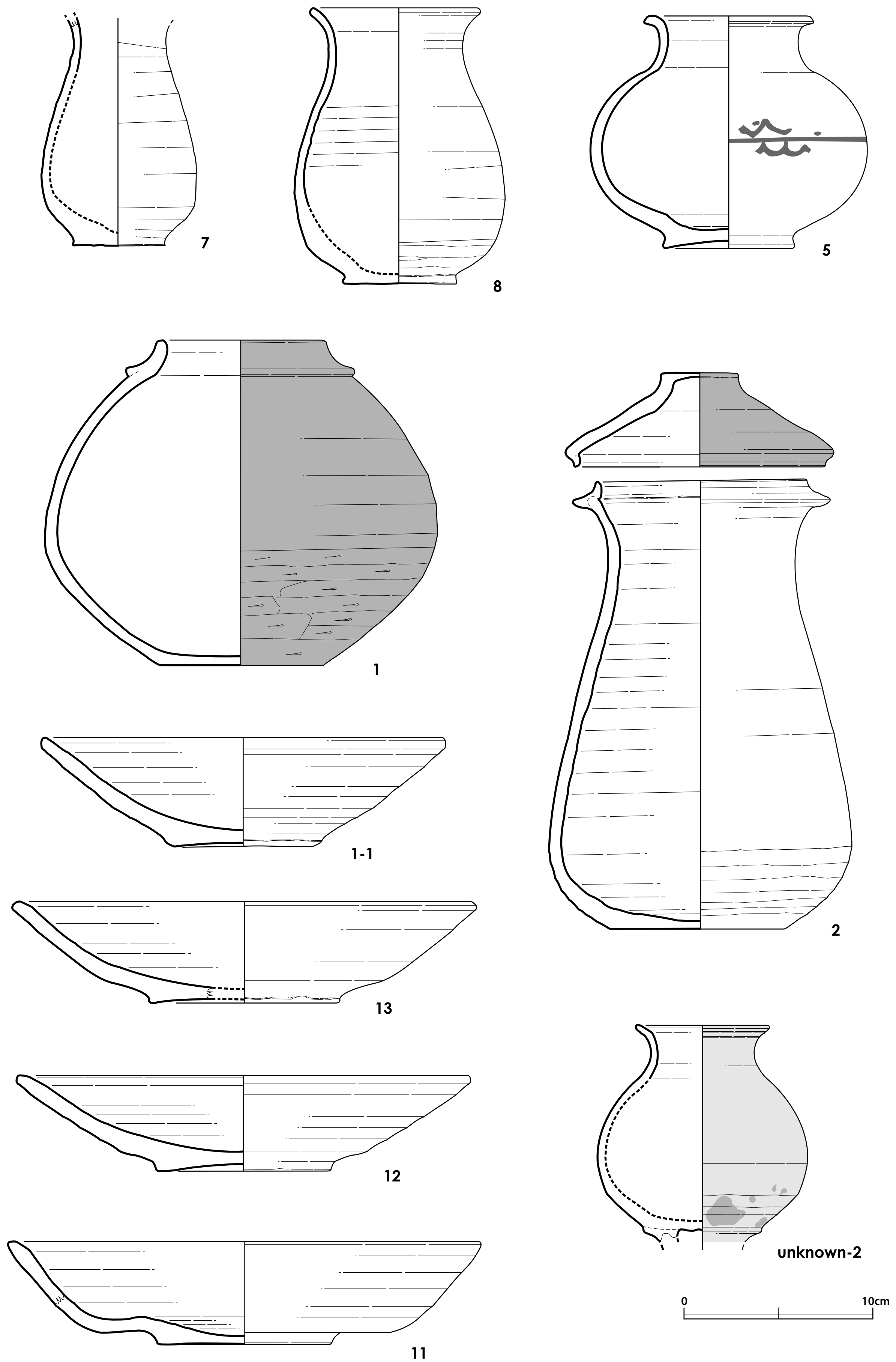


Figure 9.39 Pottery from Burial no.6 (1:3)

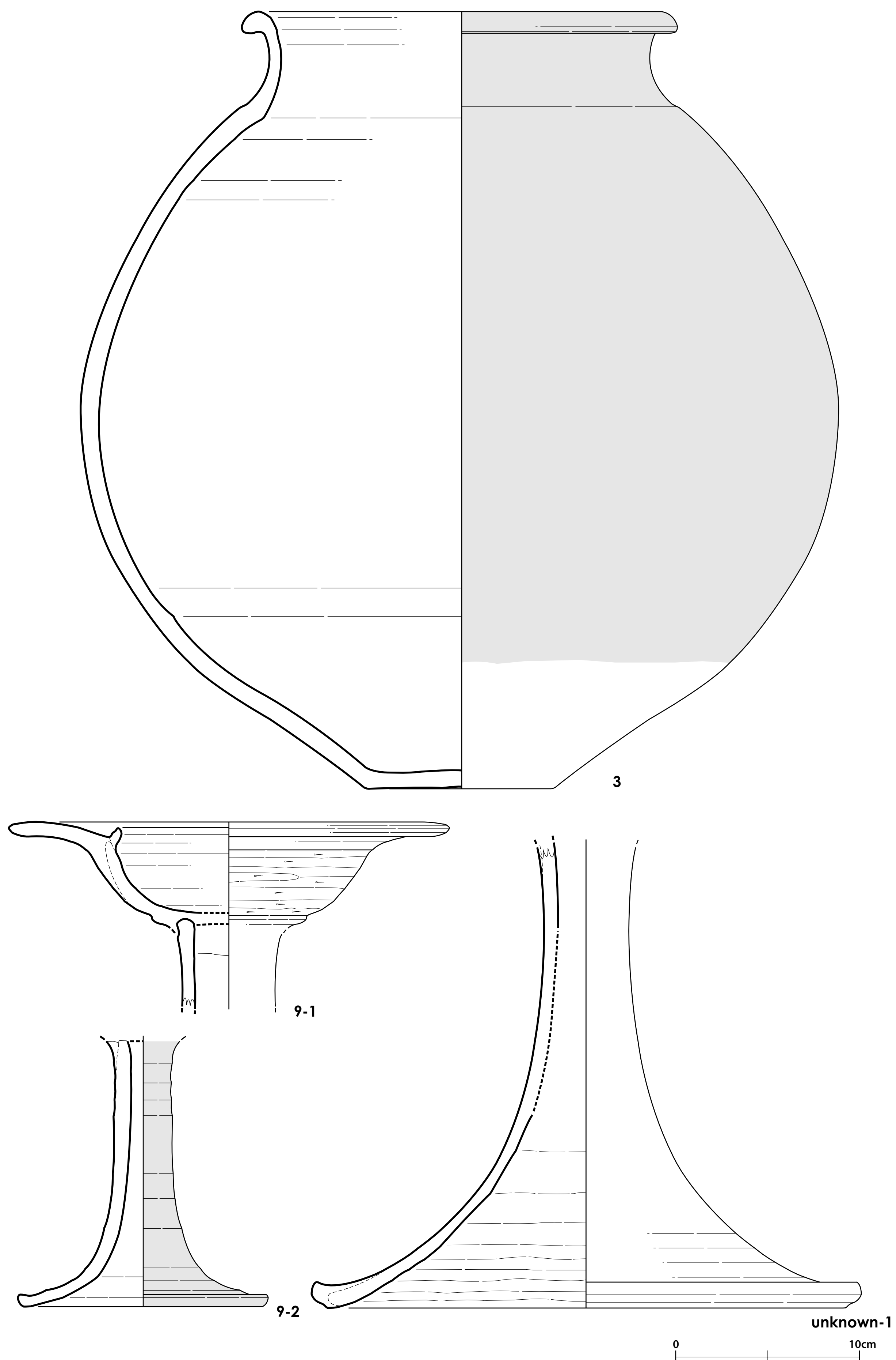


Figure 9.40 Pottery from Burial no.6 (1:3)

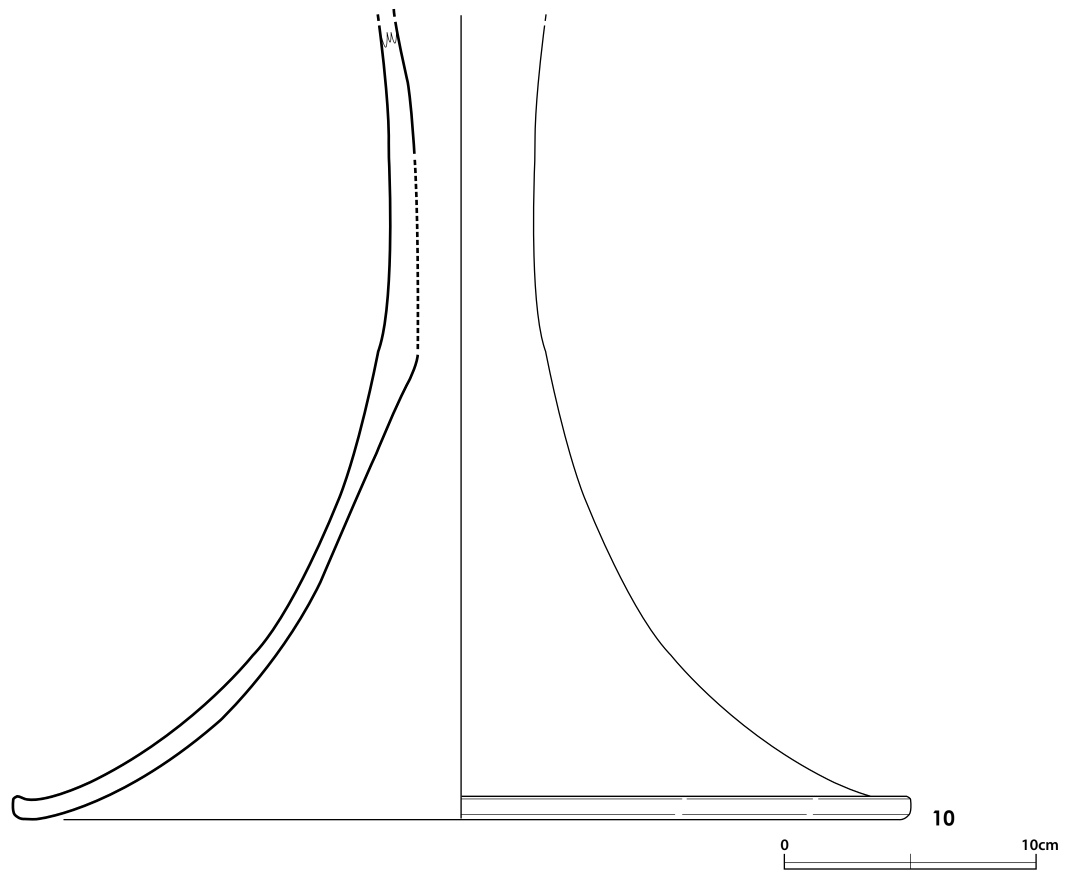


Figure 9.41 Pottery from Burial no.6 (1:3)









Figure 9.42 Pottery from Burial no.6

Figure 9.43 Pottery from Burial no.8 (1:3)



Figure 9.44 Pottery from Burial no.8

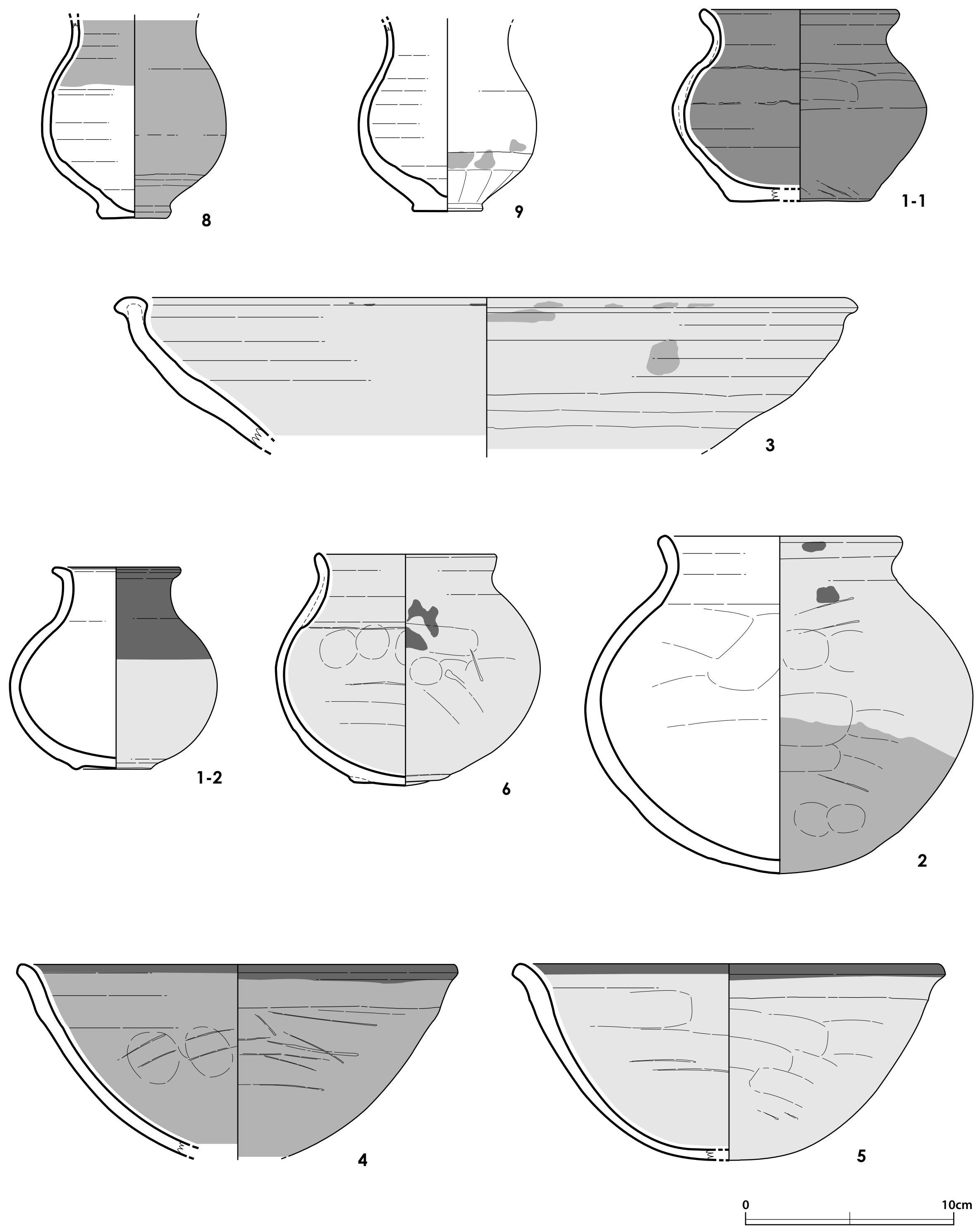


Figure 9.45 Pottery from Burial no.10 (1:3)

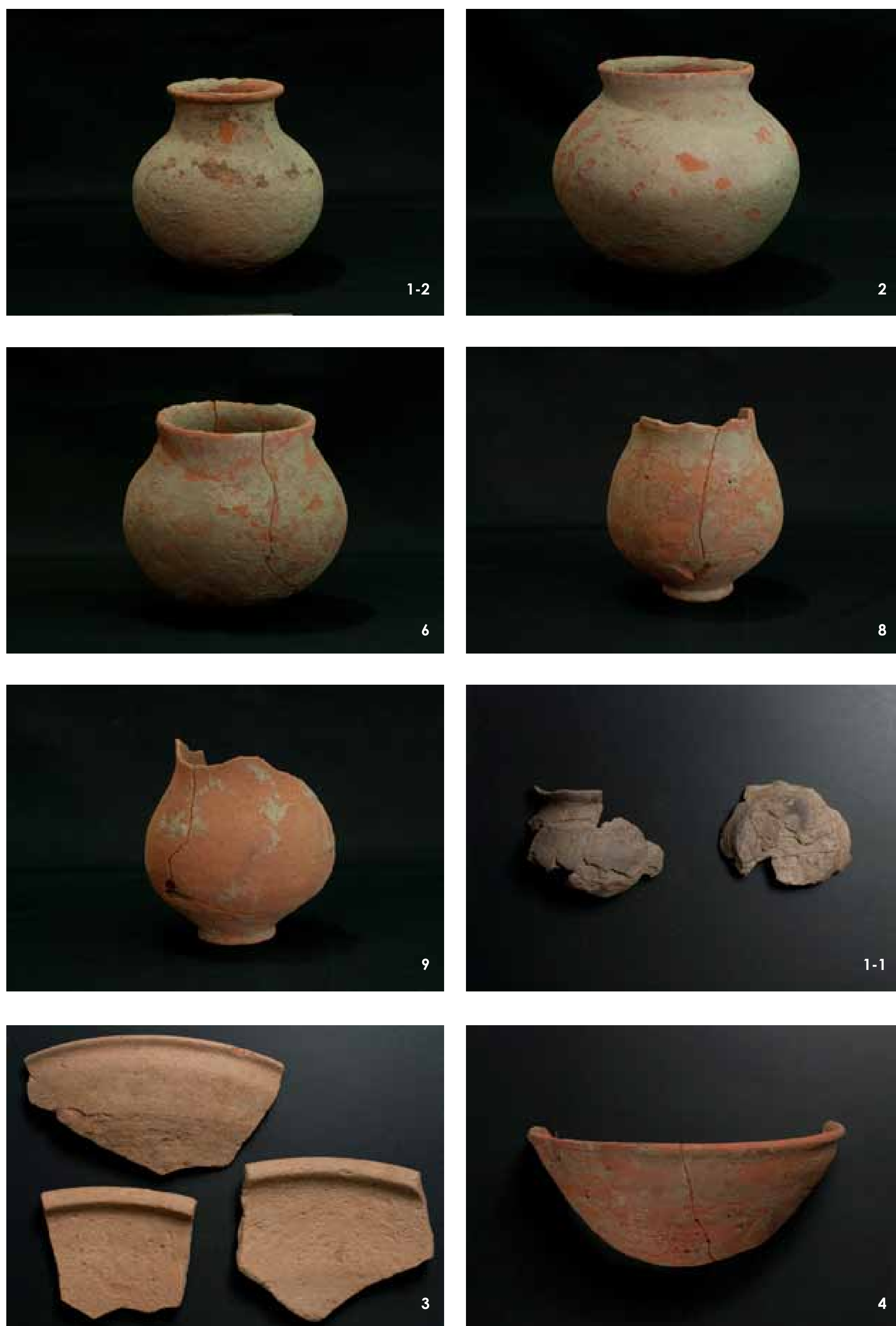


Figure 9.46 Pottery from Burial no.10

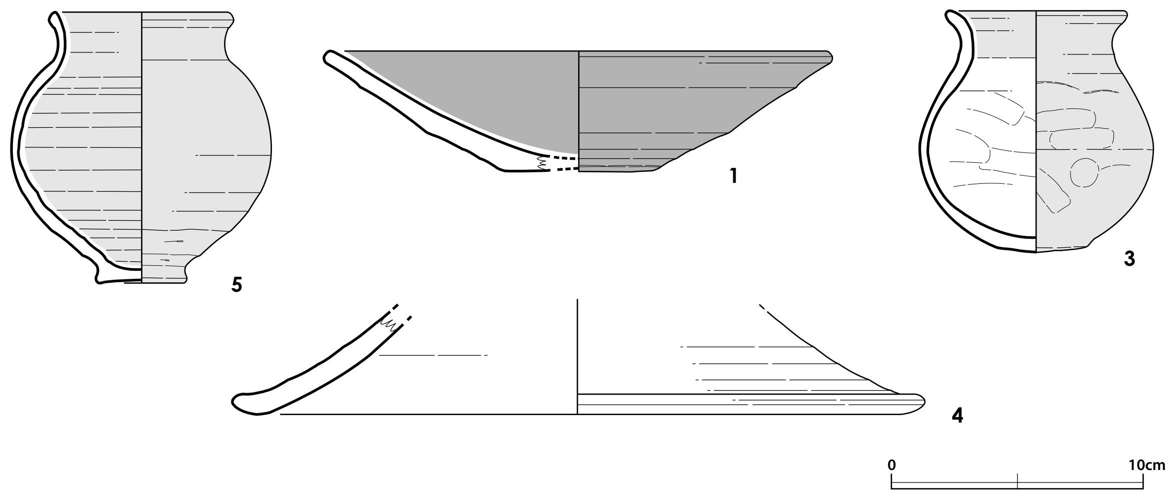


Figure 9.47 Pottery from Burial no.11 (1:3)









Figure 9.48 Pottery from Burial no.11

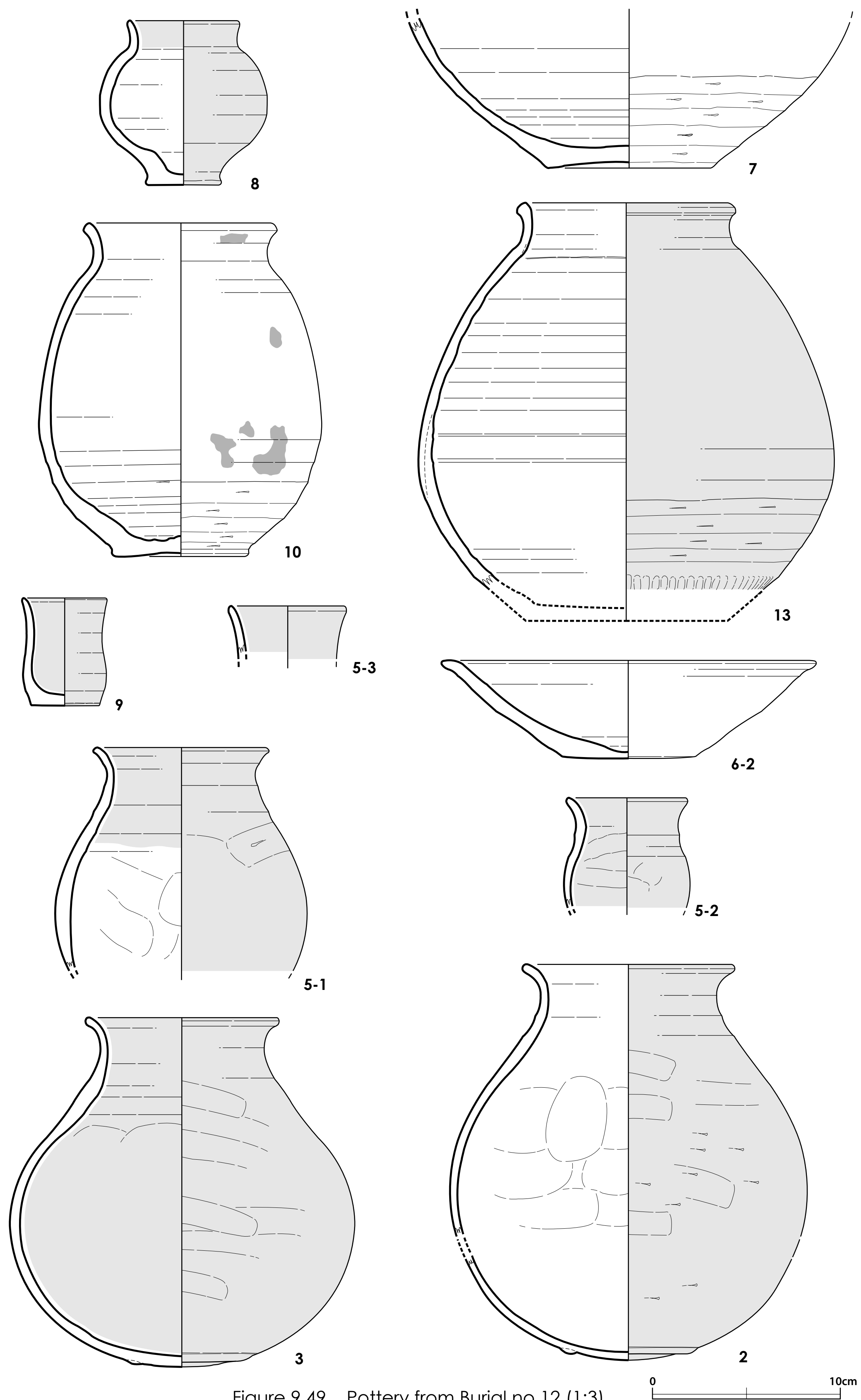


Figure 9.49 Pottery from Burial no.12 (1:3)

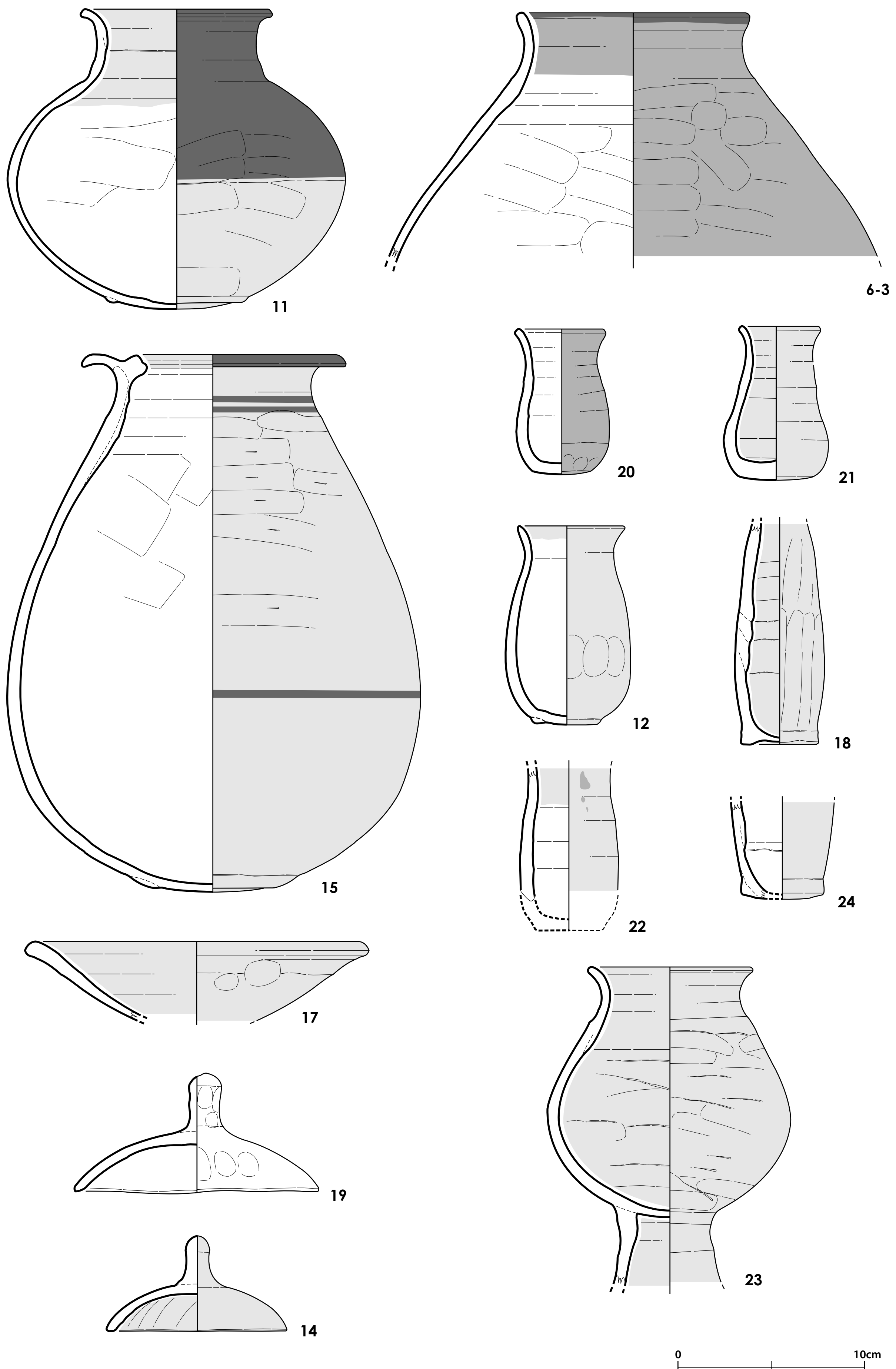


Figure 9.50 Pottery from Burial no.12 (1:3)

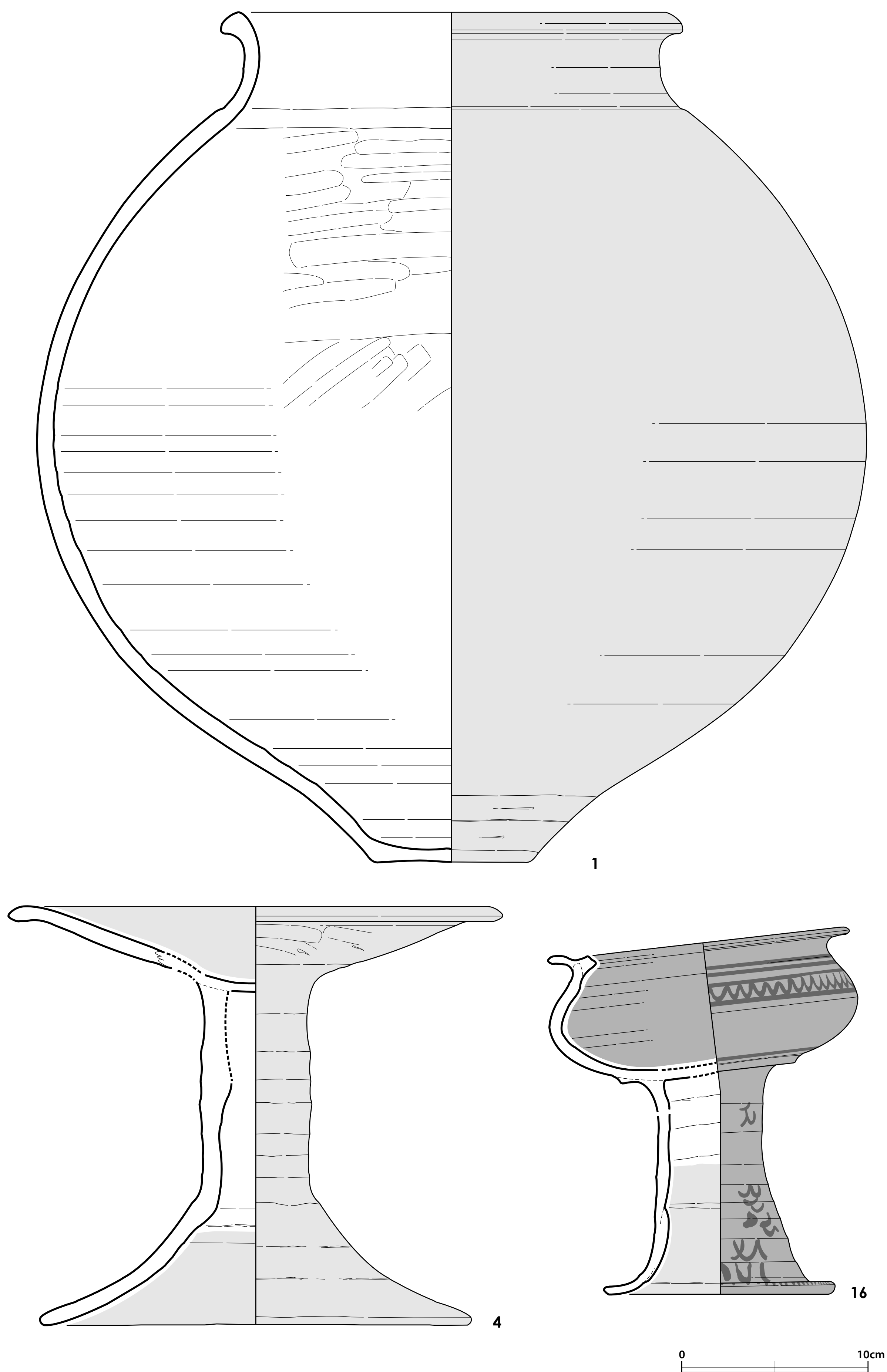


Figure 9.51 Pottery from Burial no.12 (1:3)

















Figure 9.52　Pottery from Burial no.12

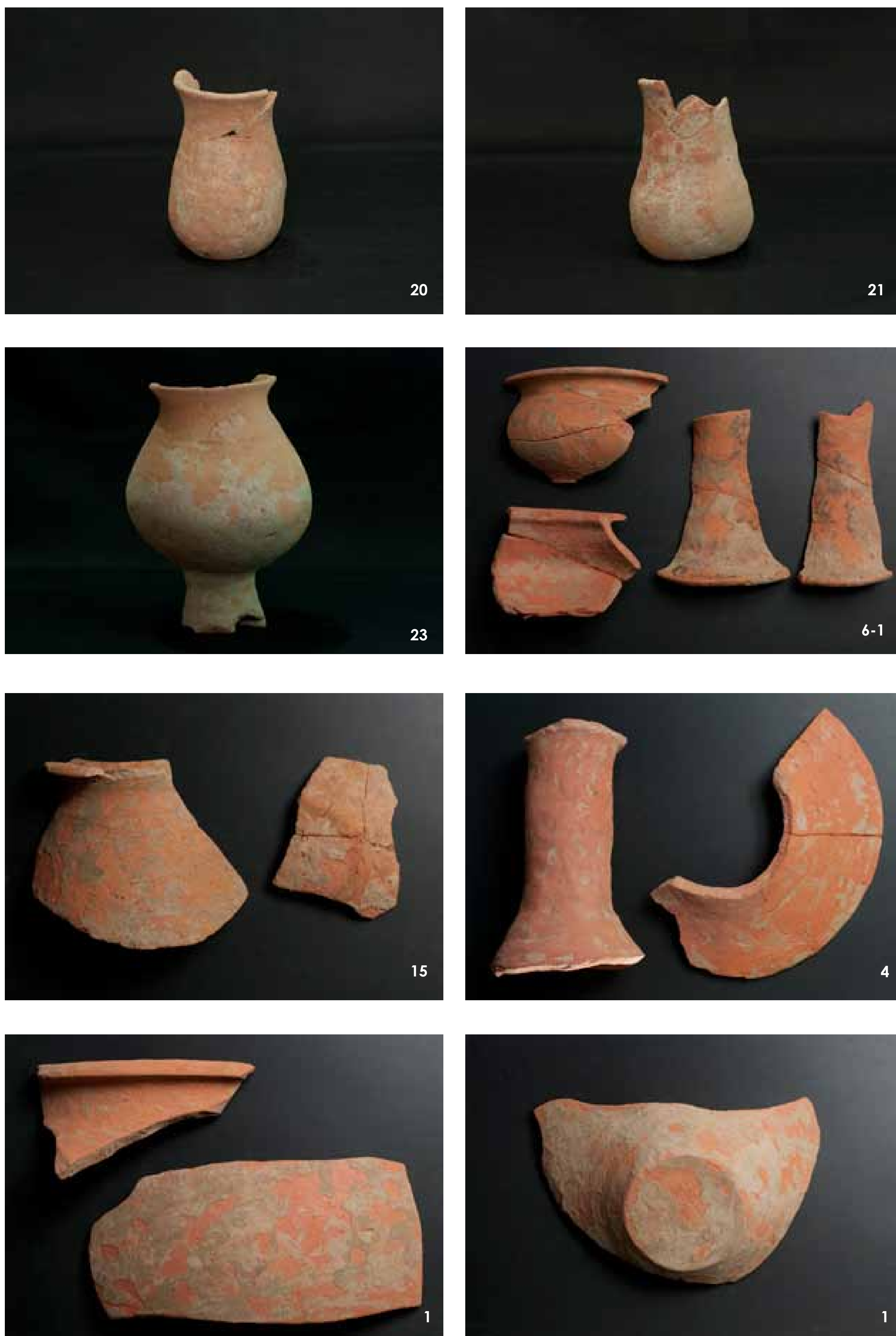


Figure 9.53 Pottery from Burial no.12

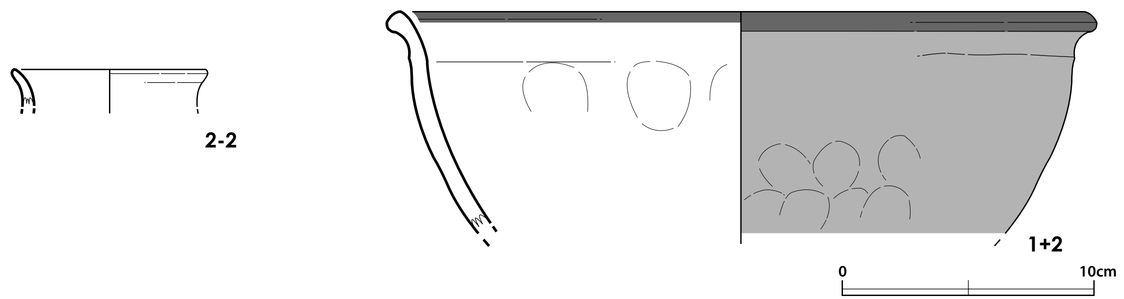


Figure 9.54　Pottery from Burial no.15 (1:3)



Figure 9.55　Pottery from Burial no.15

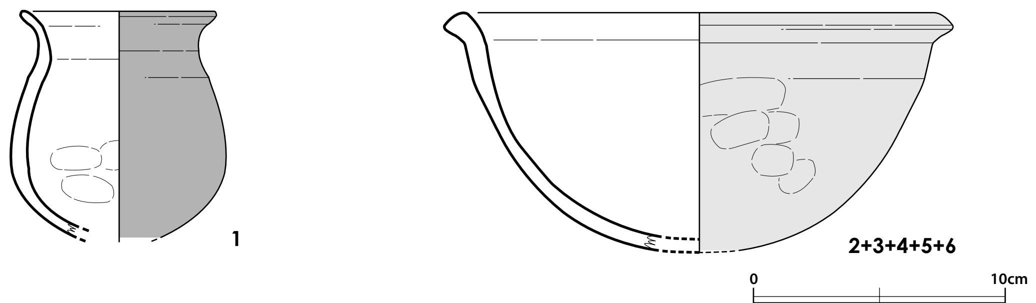


Figure 9.56　Pottery from Burial no.16 (1:3)

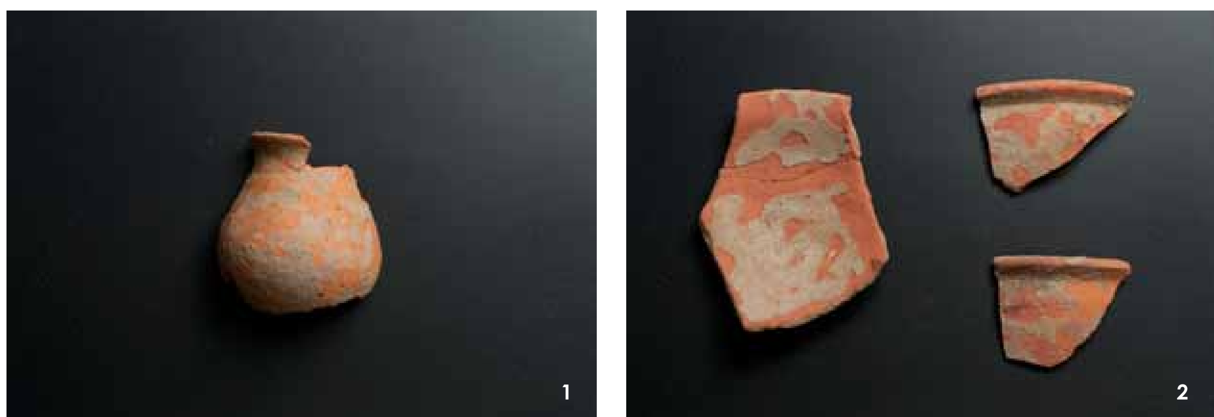


Figure 9.57　Pottery from Burial no.16

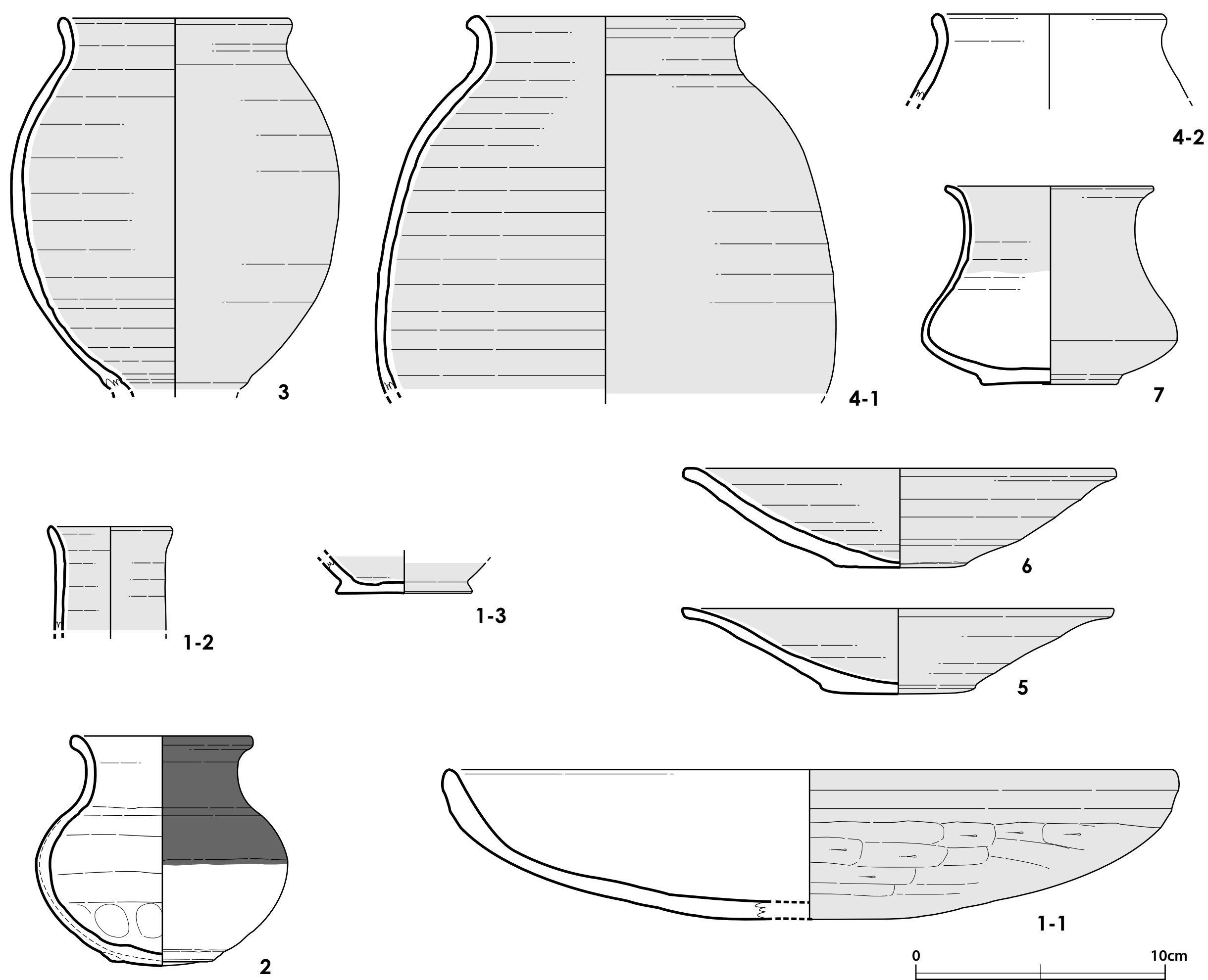


Figure 9.58 Pottery from Burial no.17 (1:3)



Figure 9.59 Pottery from Burial no.17

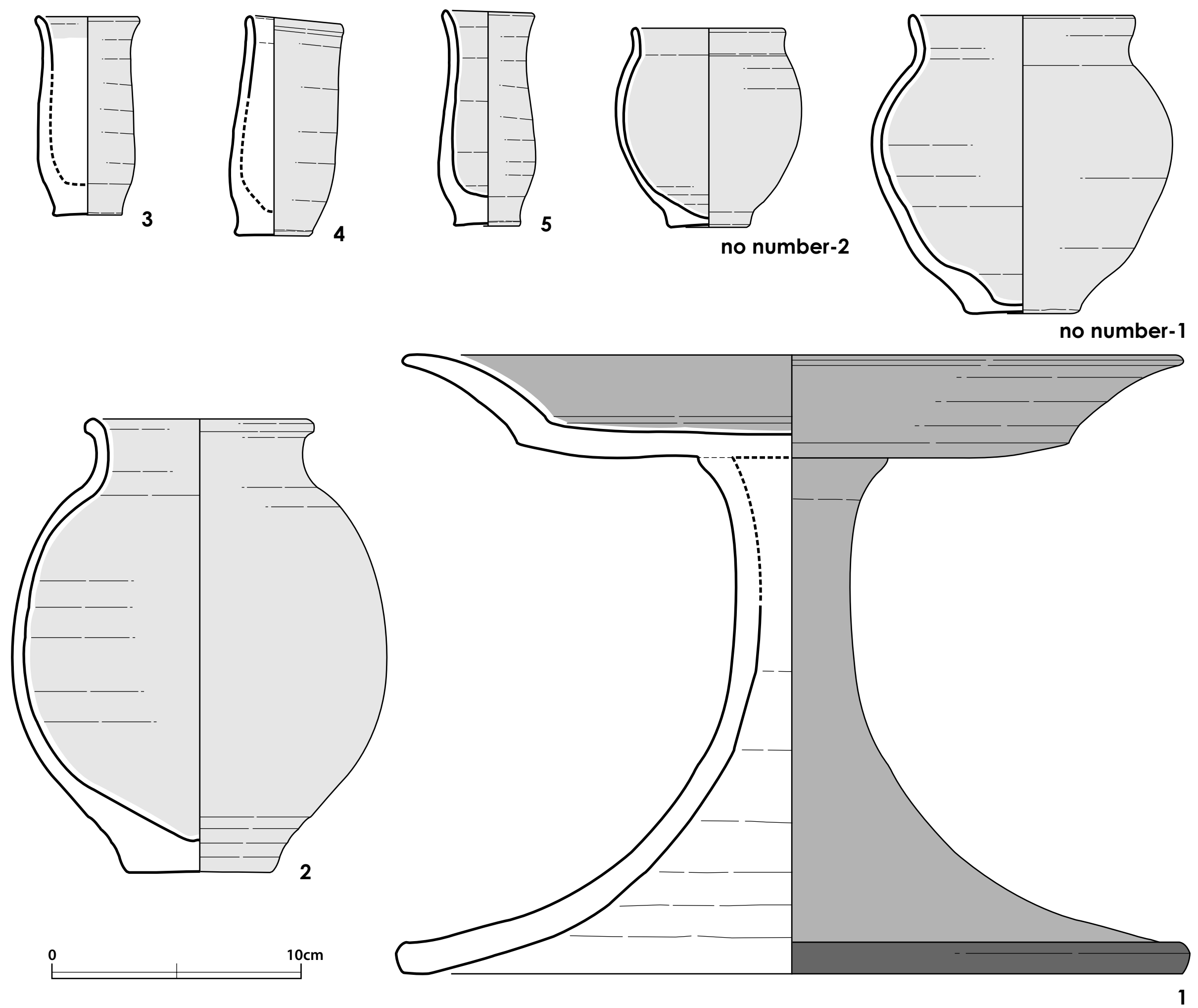


Figure 9.60 Pottery from Burial no.18 (1:3)



Figure 9.61 Pottery from Burial no.18 (1:3)

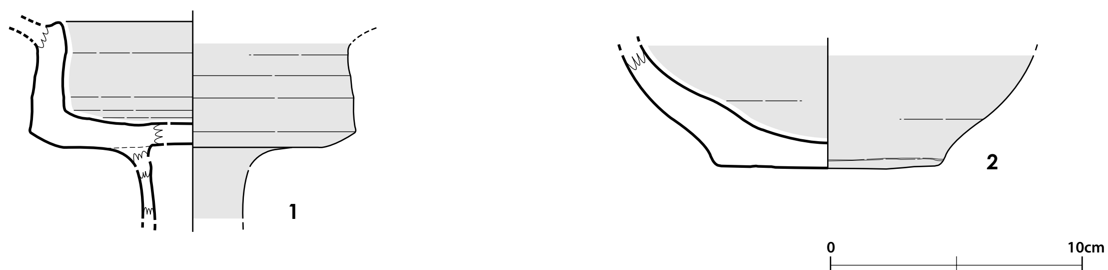


Figure 9.62 Pottery from Burial no.20 (1:3)

Figure 9.63 Pottery from Burial no.22 (1:3)



Figure 9.64 Pottery from Burial no.22

Figure 9.65 Pottery from Burial no.23 (1:3)

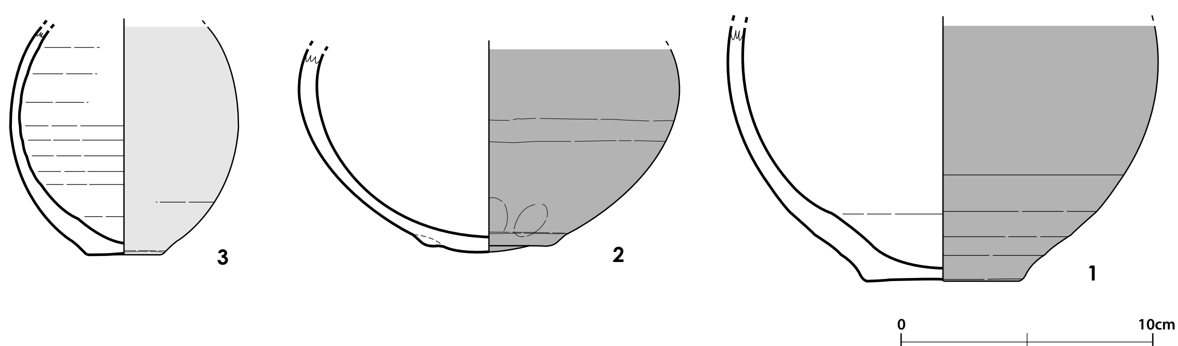


Figure 9.66 Pottery from Burial no.24 (1:3)



Figure 9.67 Pottery from Burial no.23

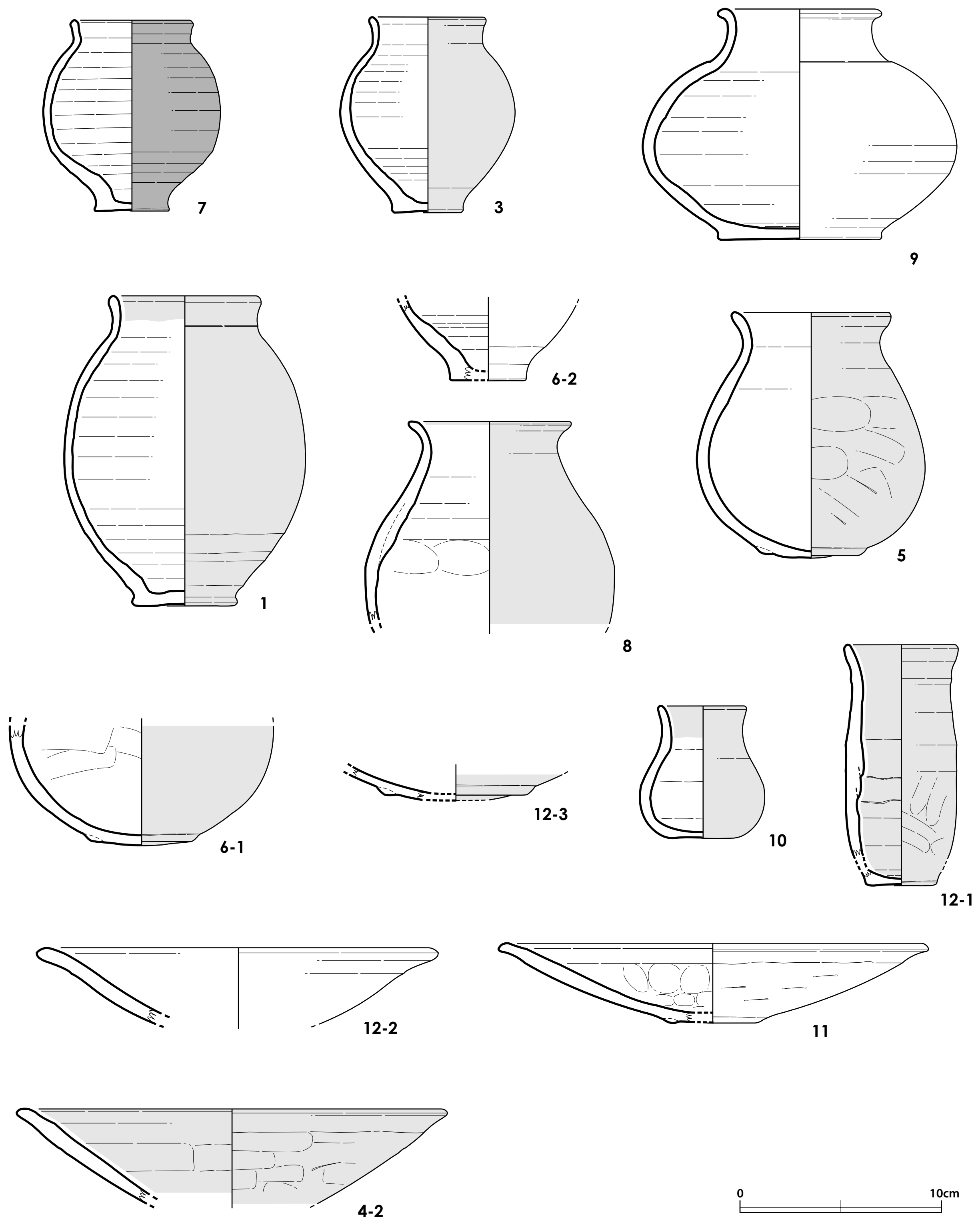


Figure 9.68 Pottery from Burial no.25 (1:3)

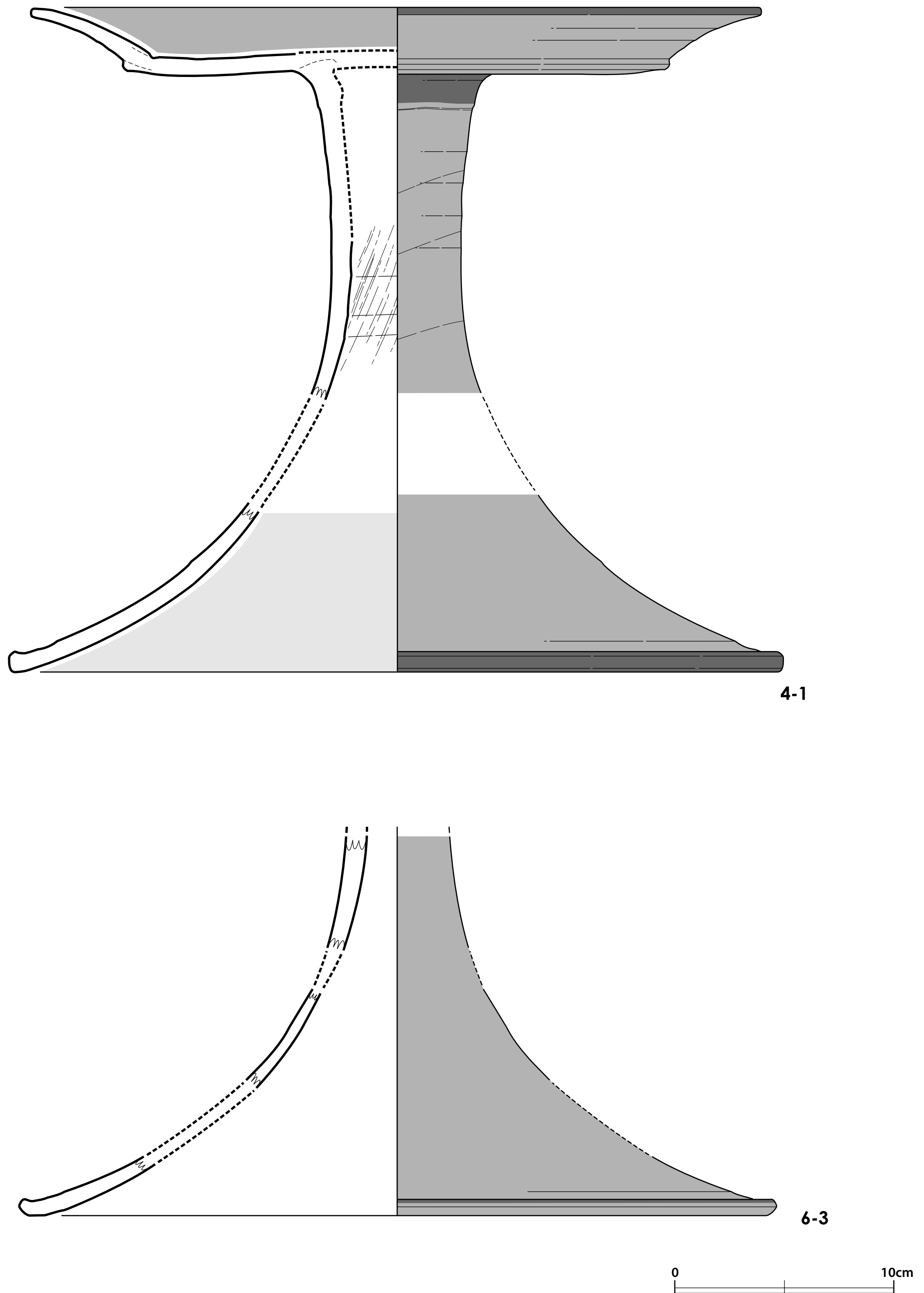


Figure 9.69 Pottery from Burial no.25 (1:3)

















Figure 9.70 Pottery from Burial no.25

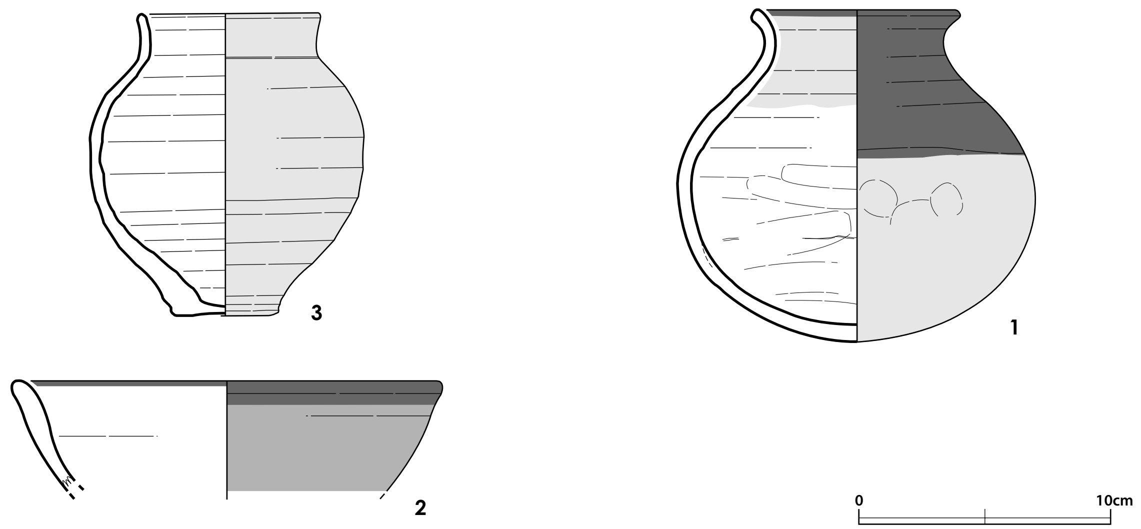


Figure 9.71 Pottery from Burial no.26 (1:3)



Figure 9.72 Pottery from Burial no.26

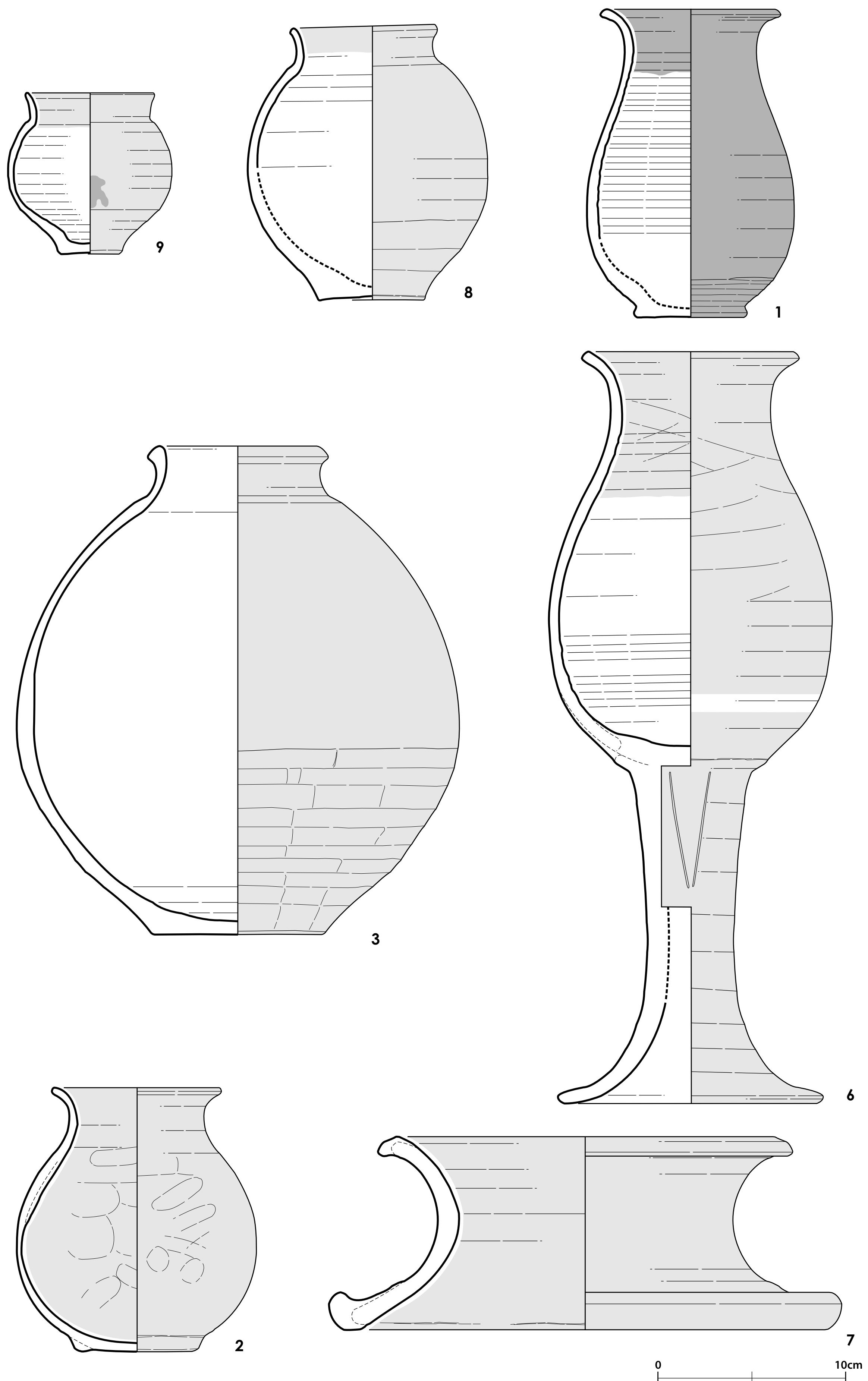


Figure 9.73 Pottery from Burial no.27 (1:3)

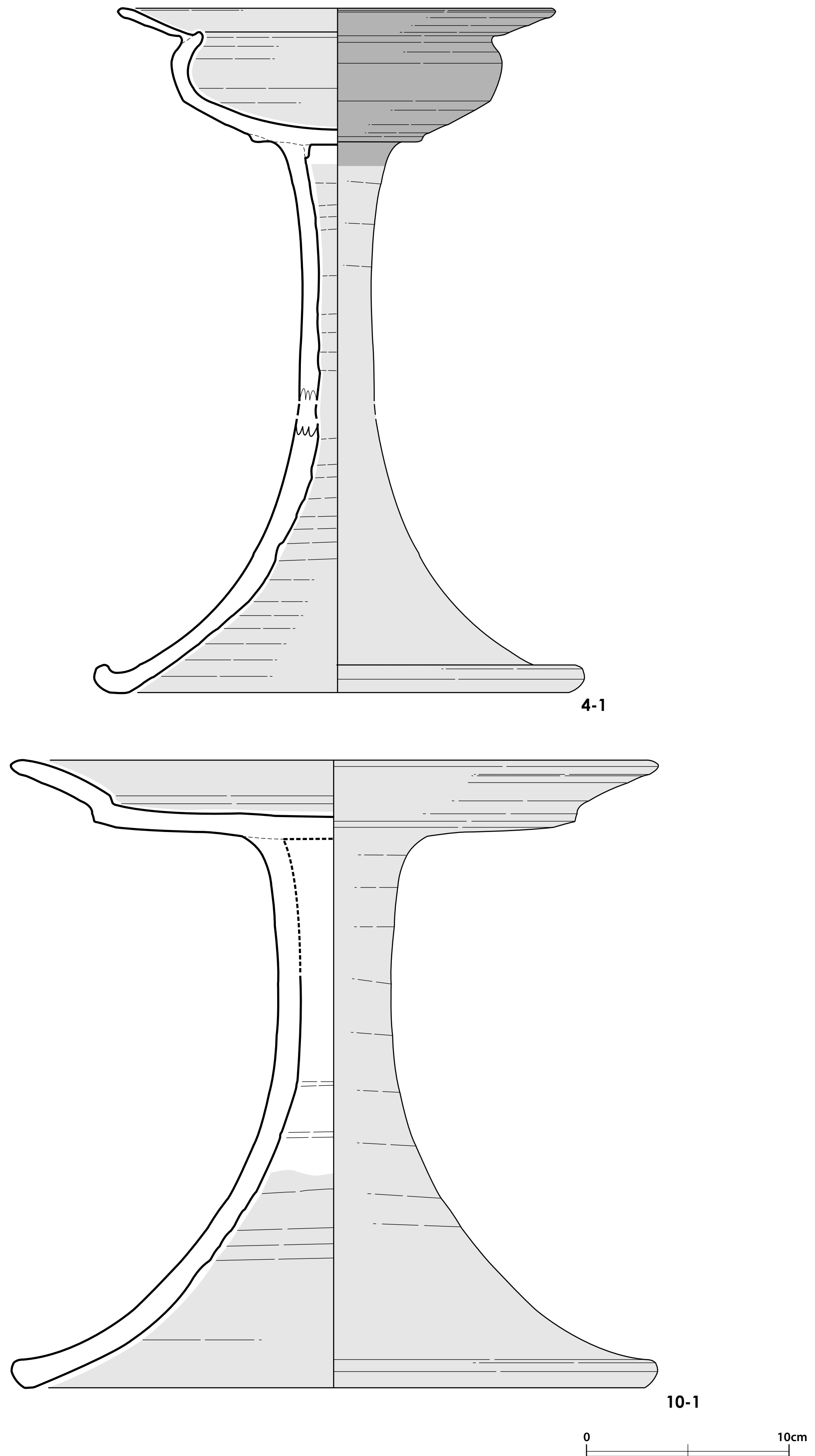


Figure 9.74 Pottery from Burial no.27 (1:3)

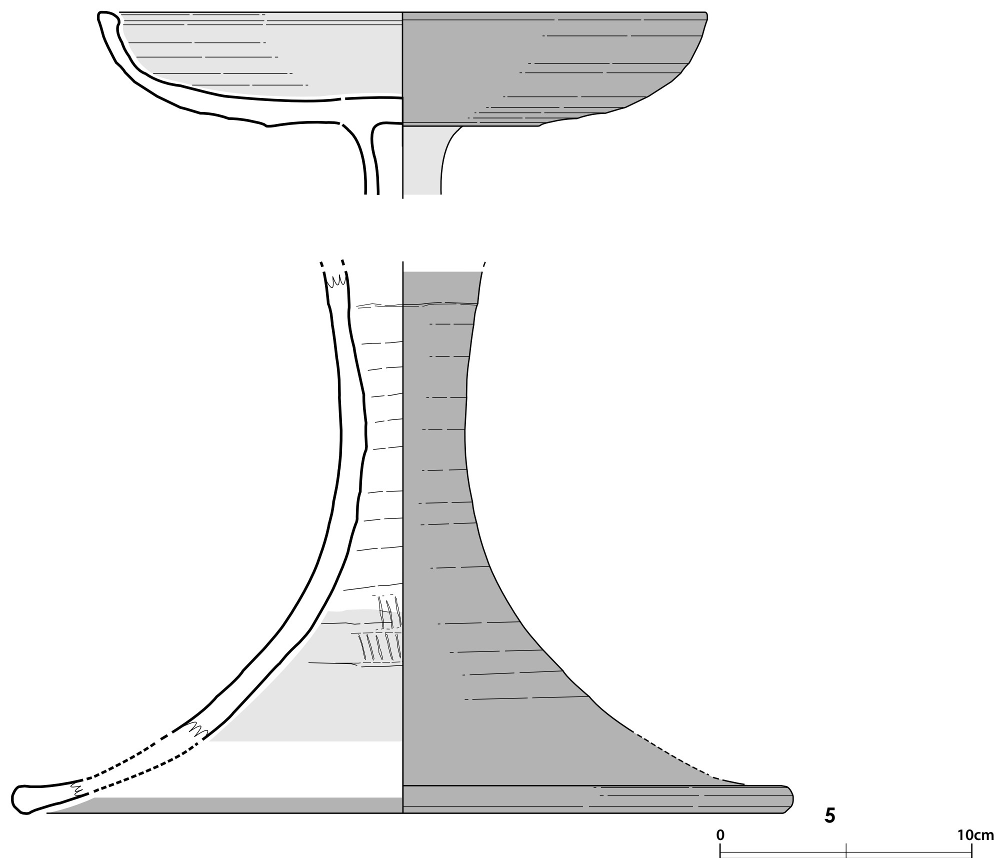


Figure 9.75 Pottery from Burial no.27 (1:3)





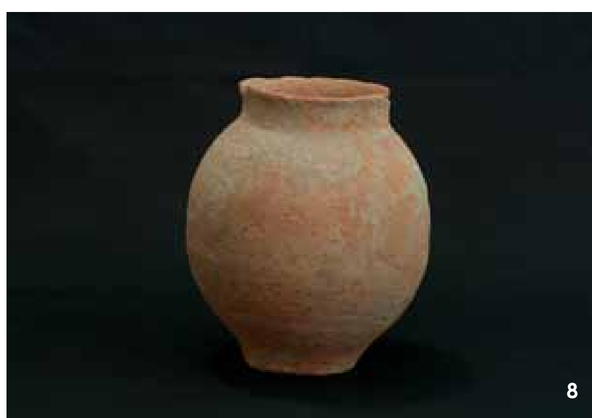




Figure 9.76 Pottery from Burial no.27

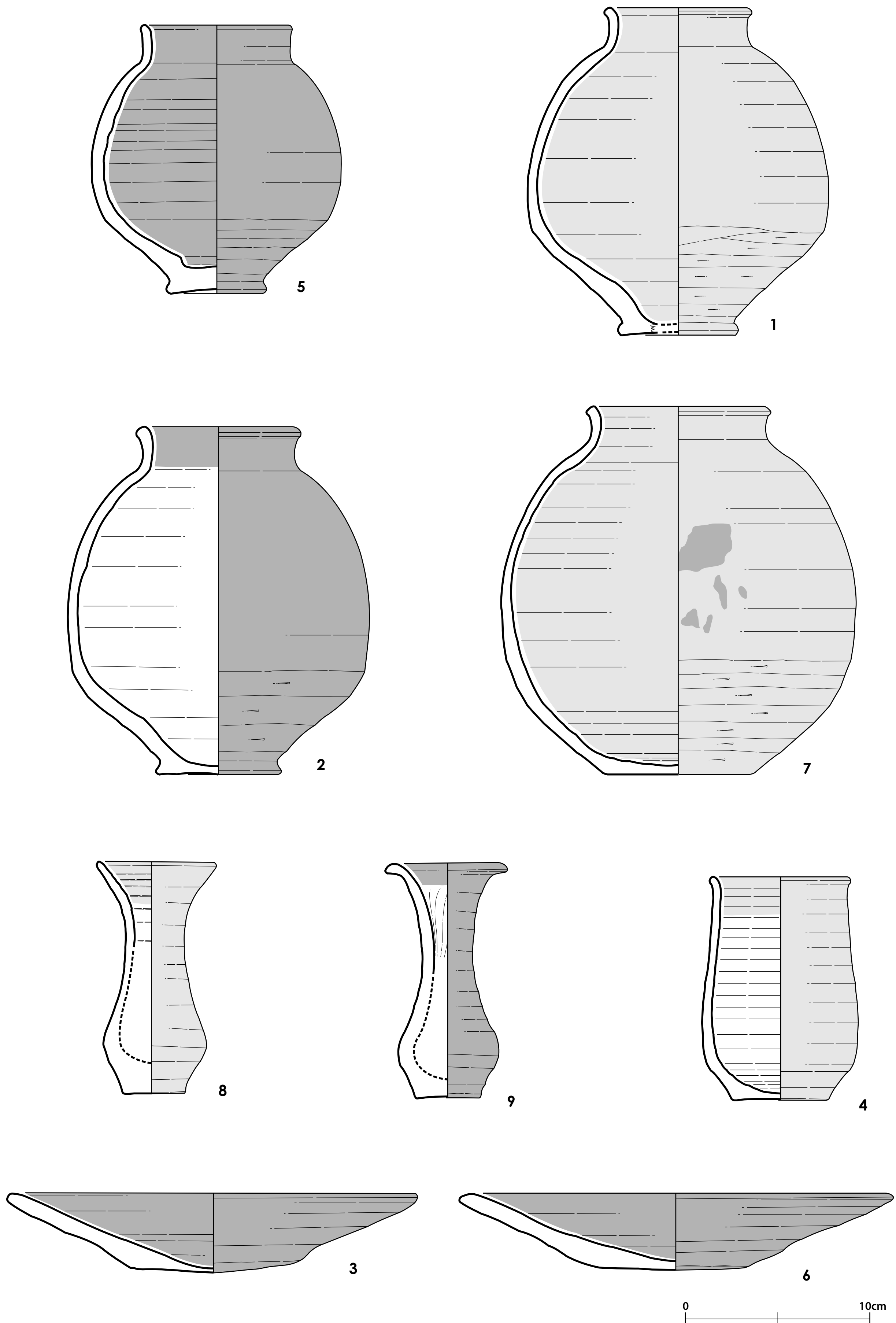


Figure 9.77 Pottery from Burial no.28 (1:3)

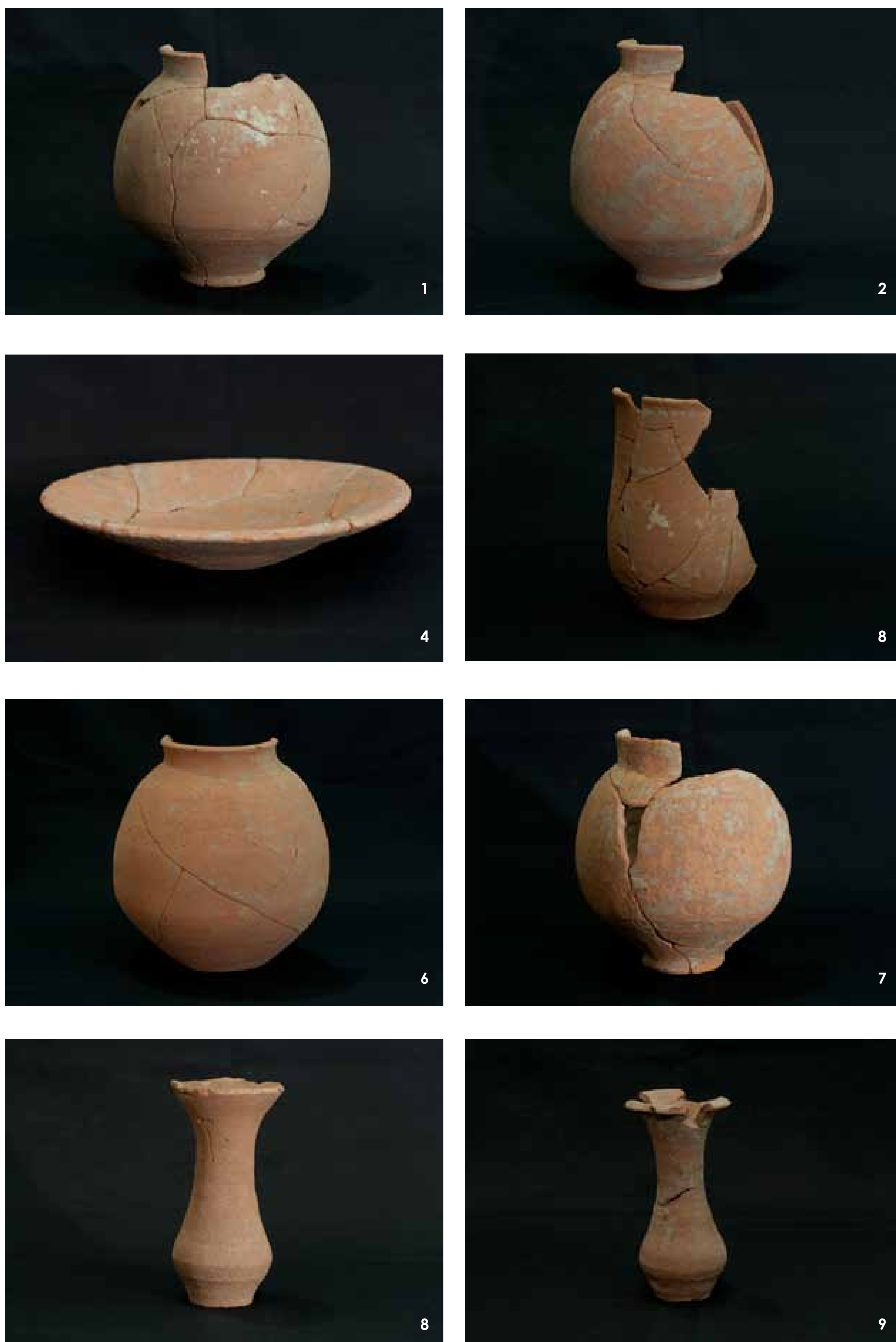


Figure 9.78 Pottery from Burial no.28

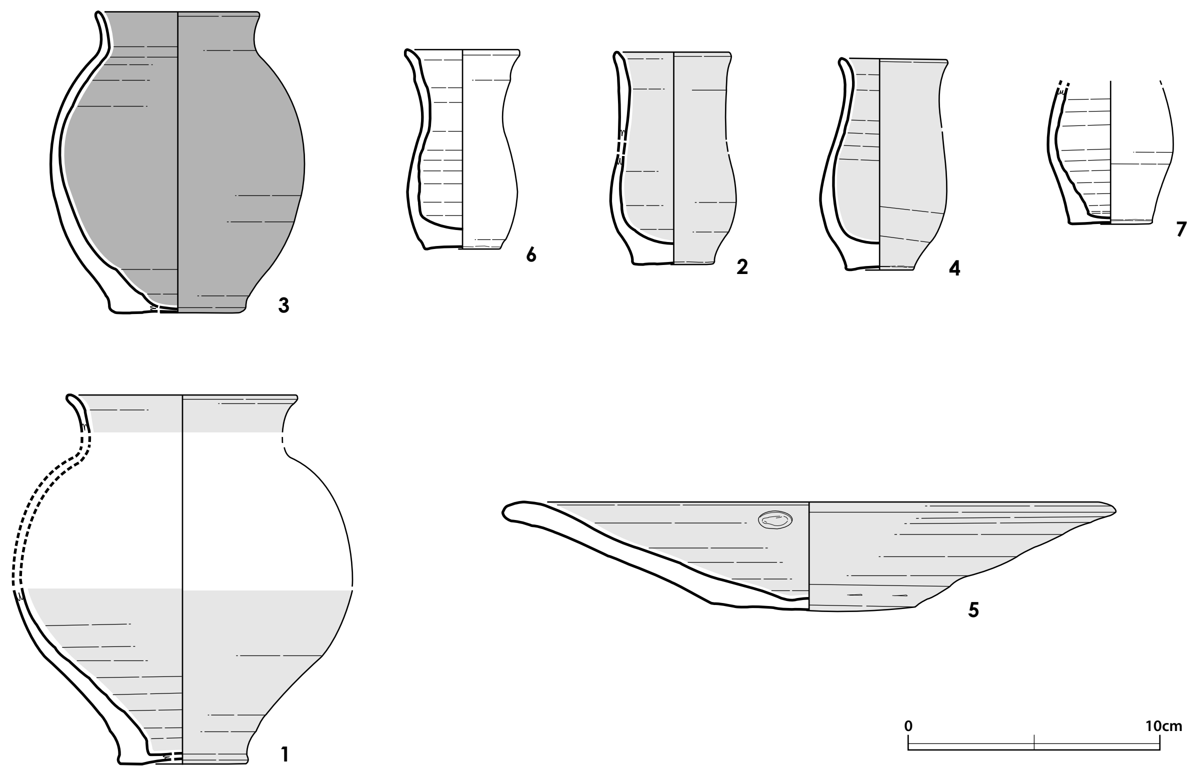


Figure 9.79 Pottery from Burial no.29 (1:3)



Figure 9.80 Pottery from Burial no.29

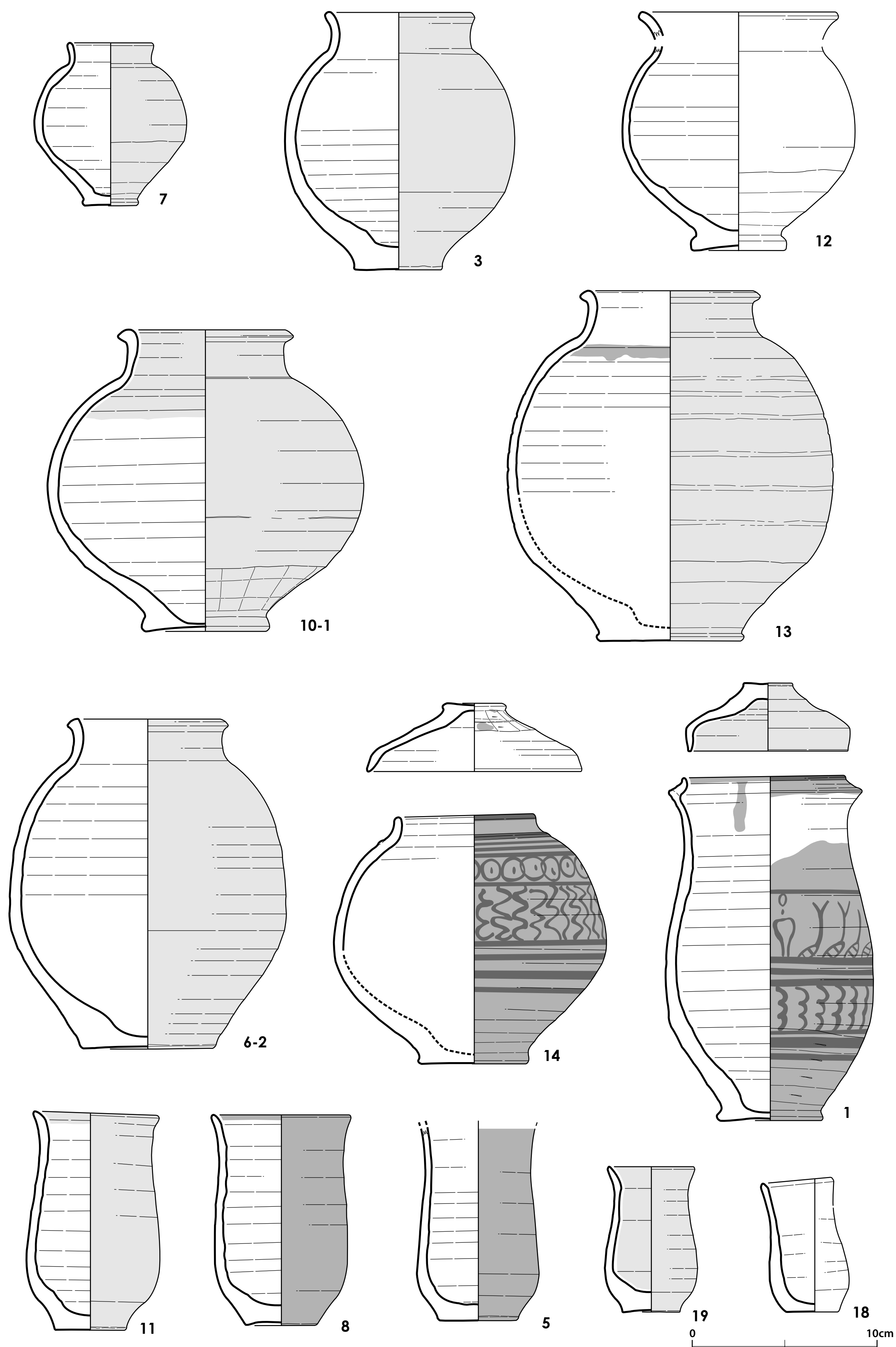


Figure 9.81 Pottery from Burial no.32 (1:3)

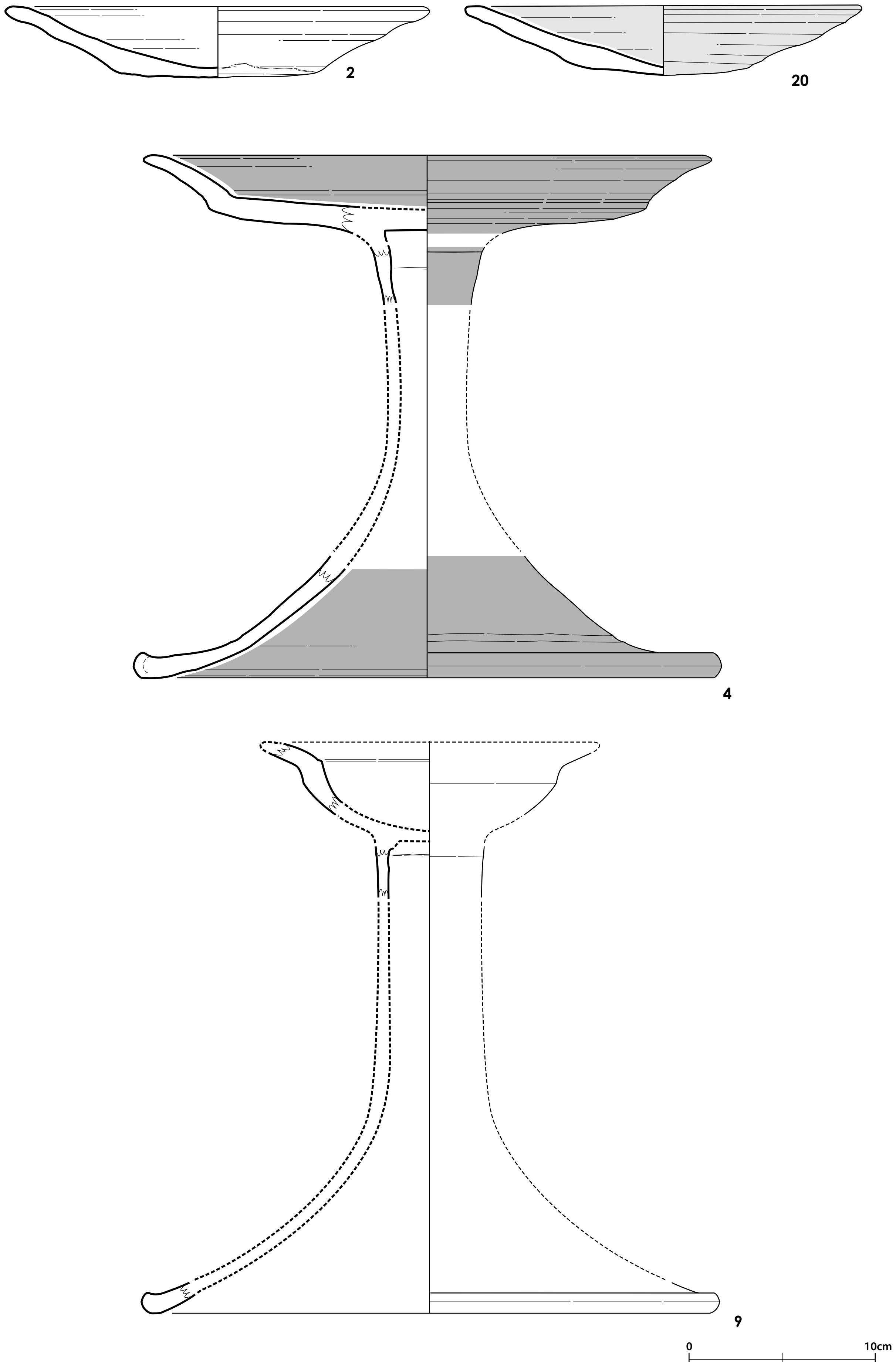


Figure 9.82 Pottery from Burial no.32 (1:3)

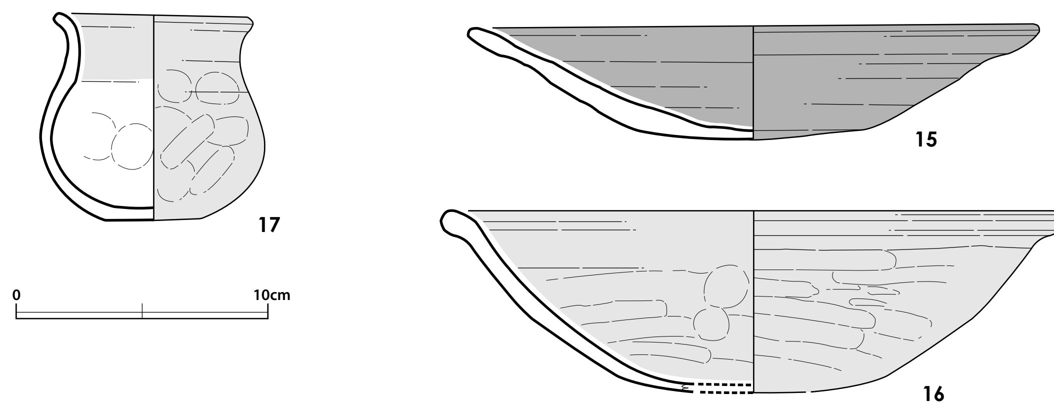


Figure 9.83 Pottery from Burial no.32 (1:3)

Figure 9.84 Pottery from Burial no.32











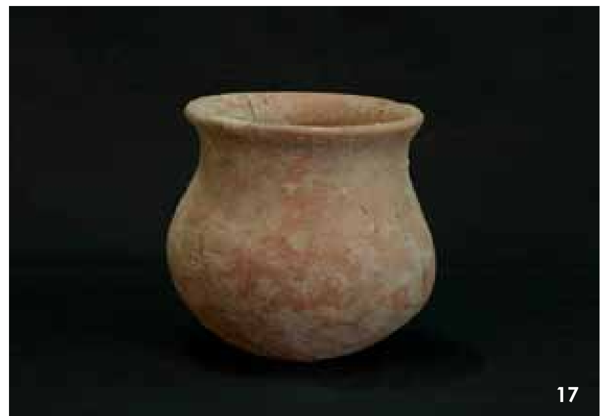






Figure 9.85 Pottery from Burial no.32

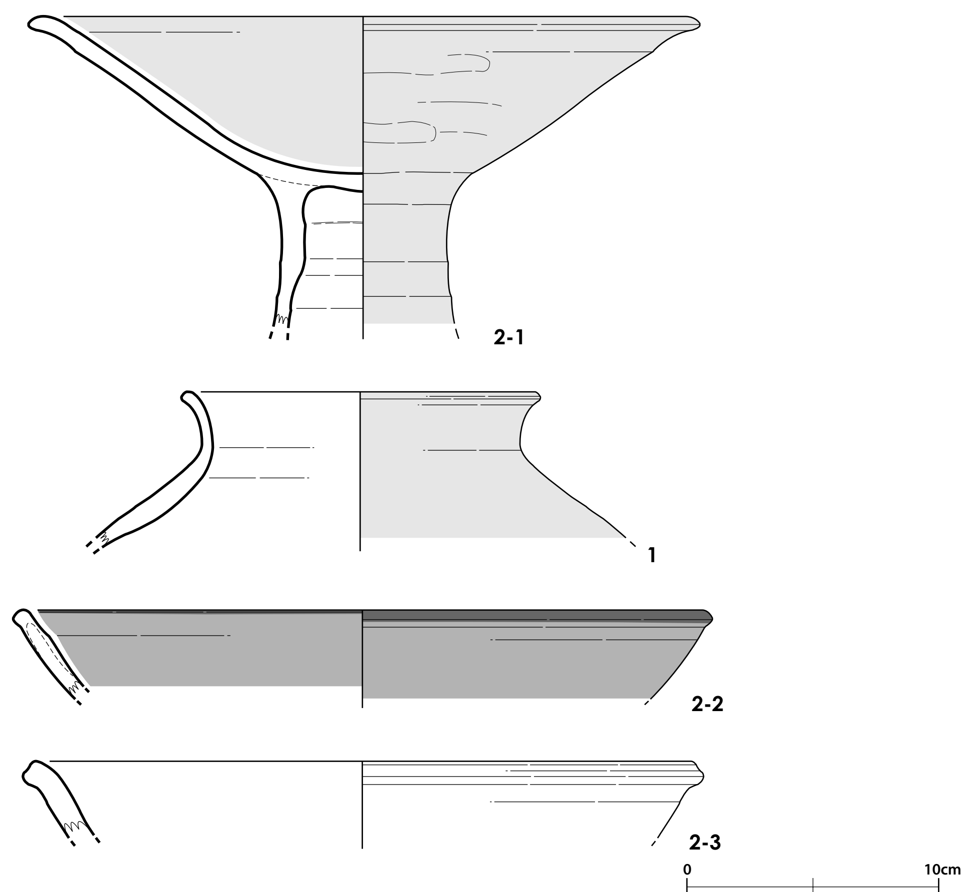


Figure 9.86 Pottery from Burial no.33 (1:3)

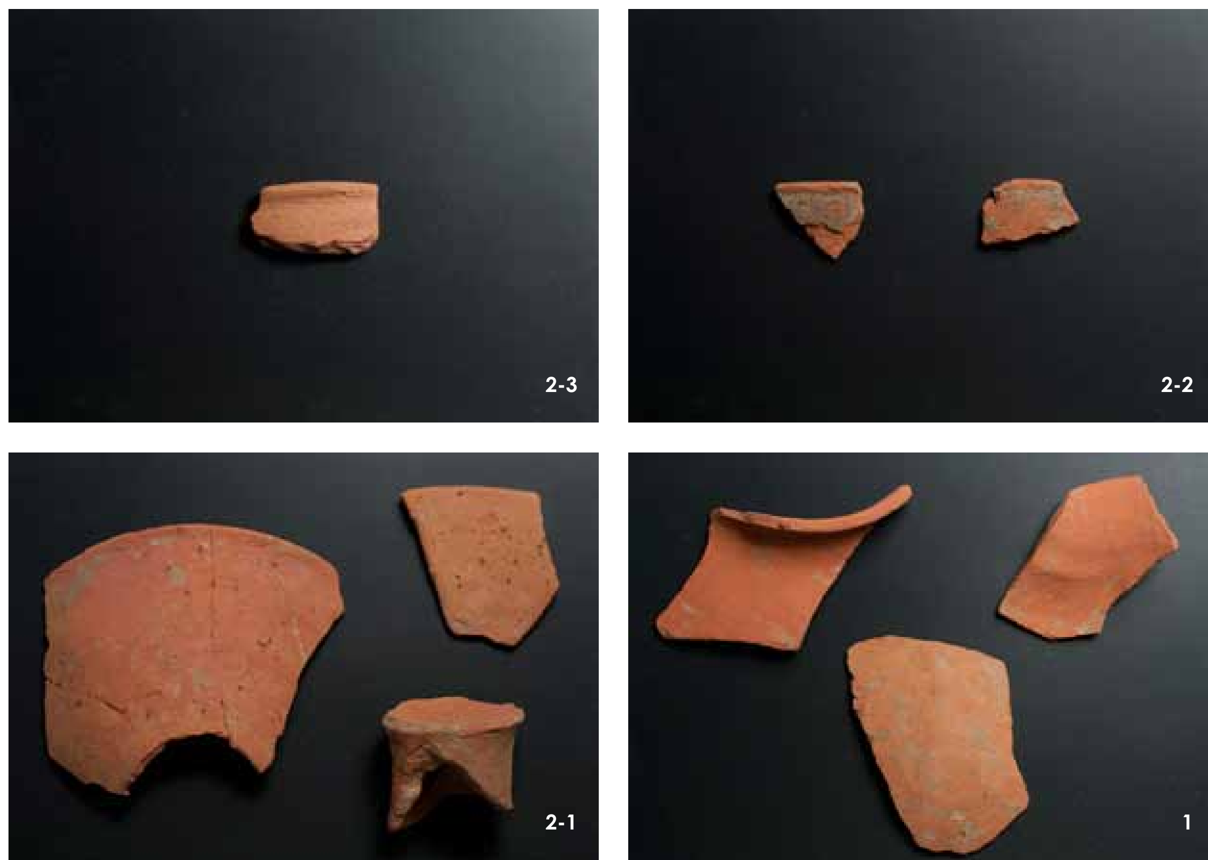


Figure 9.87 Pottery from Burial no.33

Figure 9.88 Pottery from Burial no.34 (1:3)



Figure 9.89 Pottery from Burial no.34 (1:3)

Figure 9.90 Pottery from Burial no.38 (1:3)



Figure 9.91 Pottery from Burial no.38 (1:3)

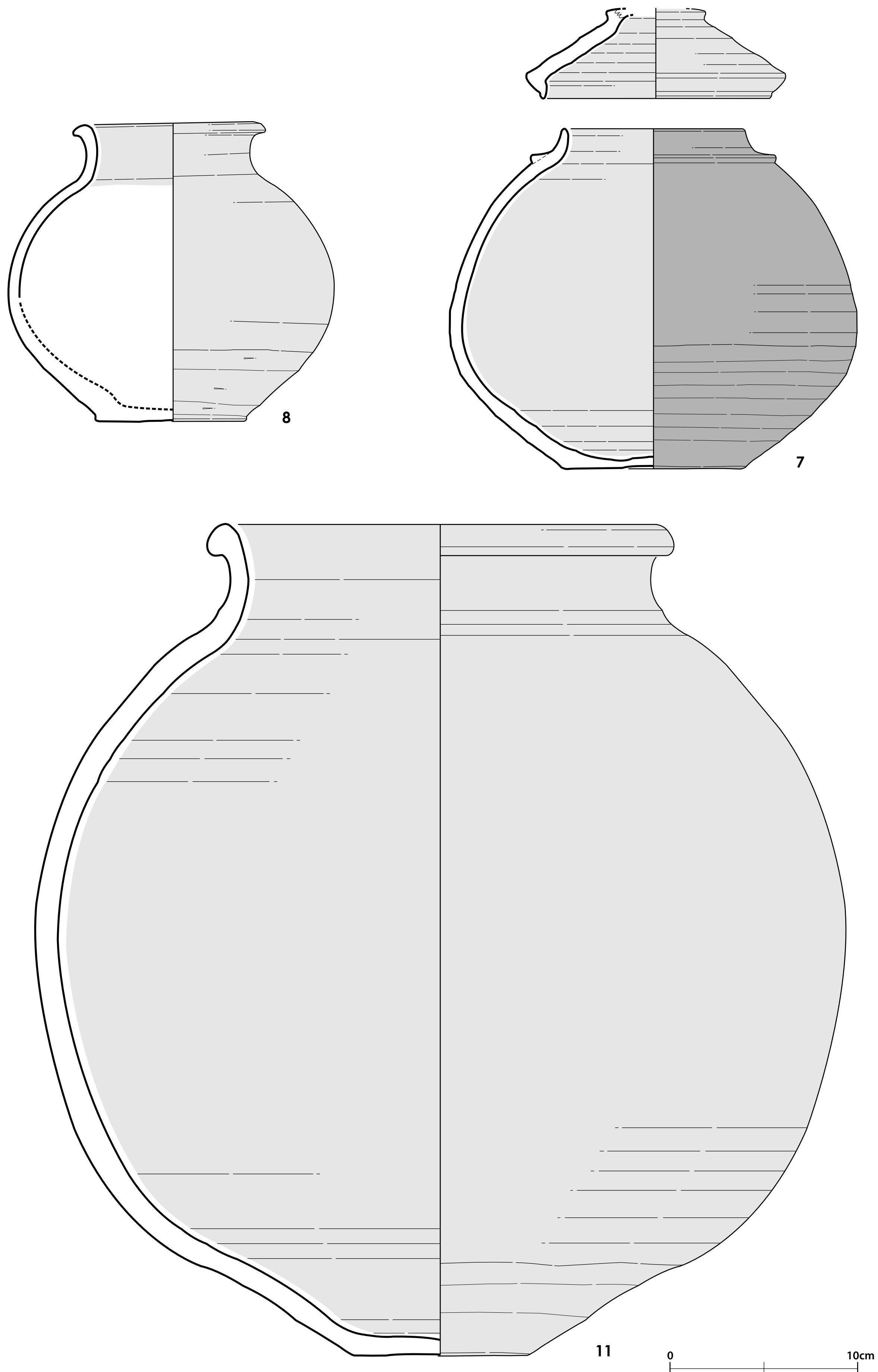


Figure 9.92 Pottery from Burial no.39 (1:3)

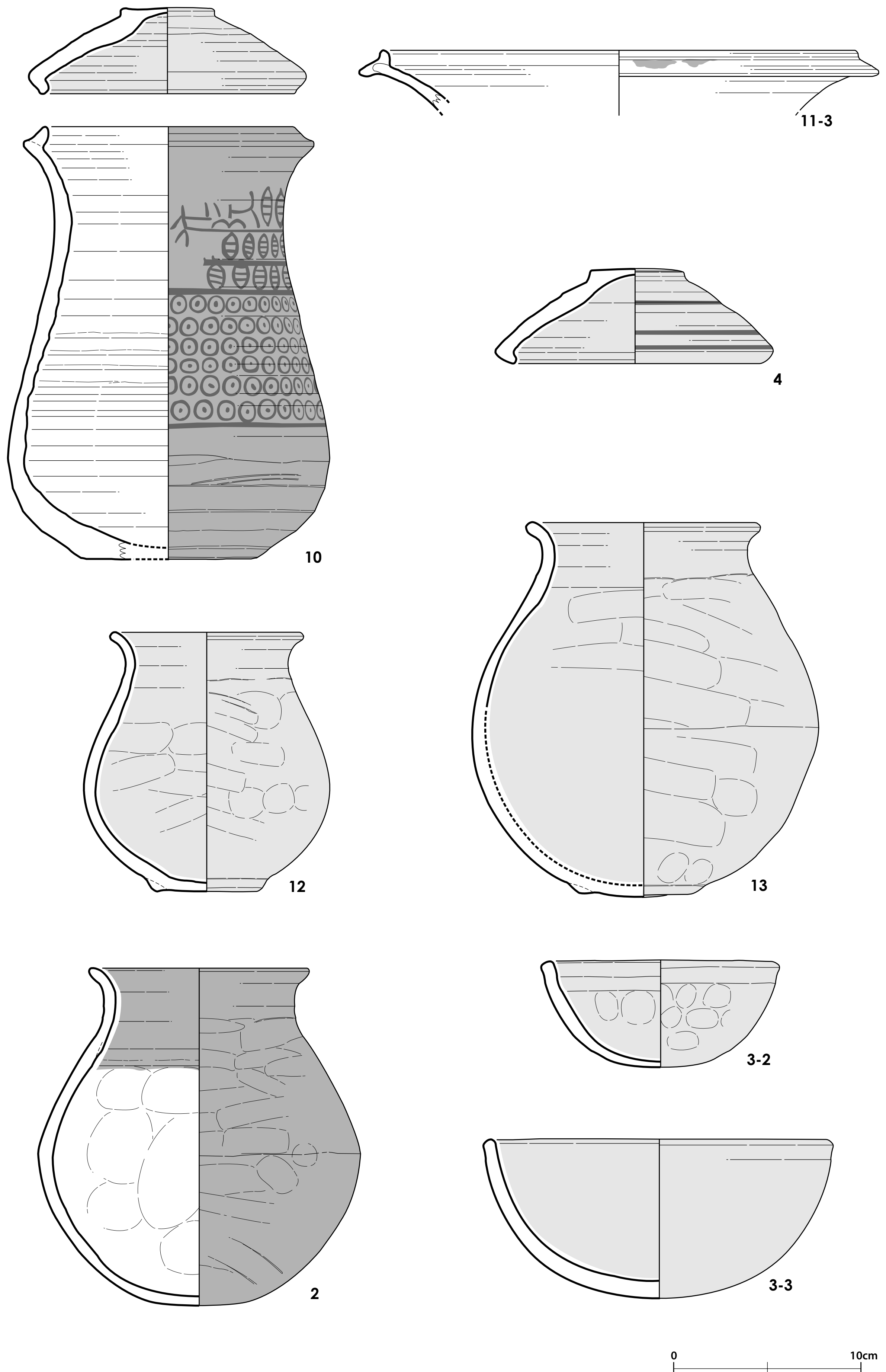


Figure 9.93 Pottery from Burial no.39 (1:3)

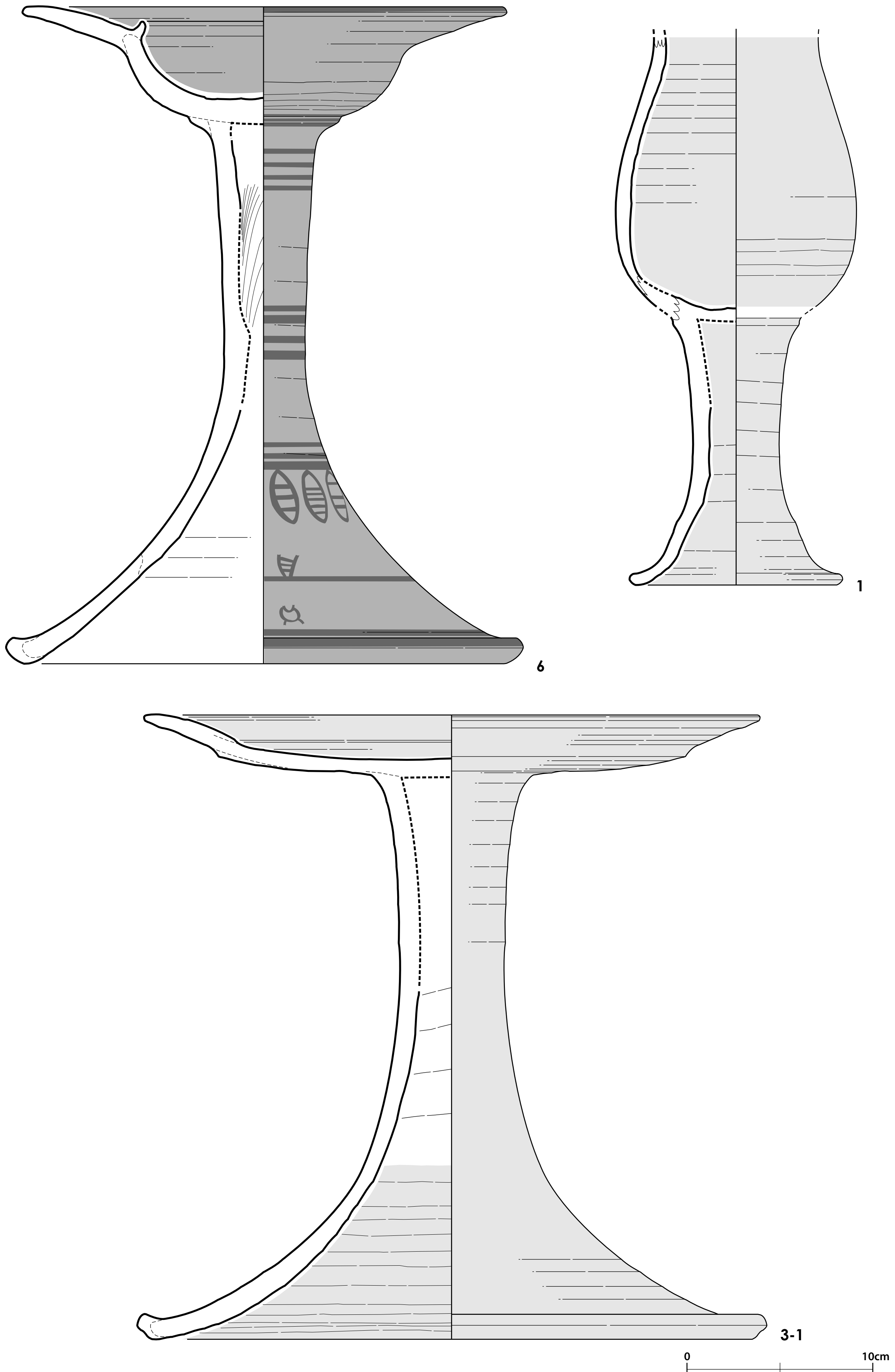


Figure 9.94 Pottery from Burial no.39 (1:3)











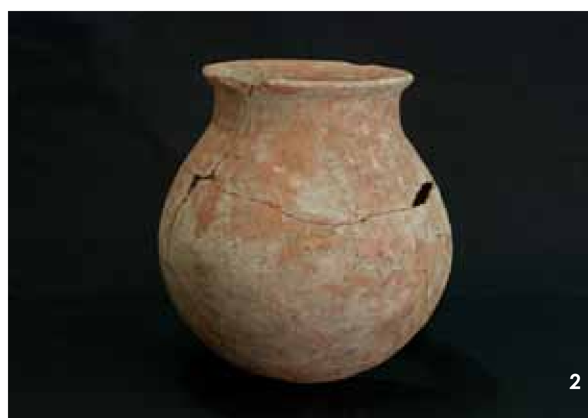






Figure 9.95 Pottery from Burial no.39















Figure 9.96 Pottery from Burial no.39

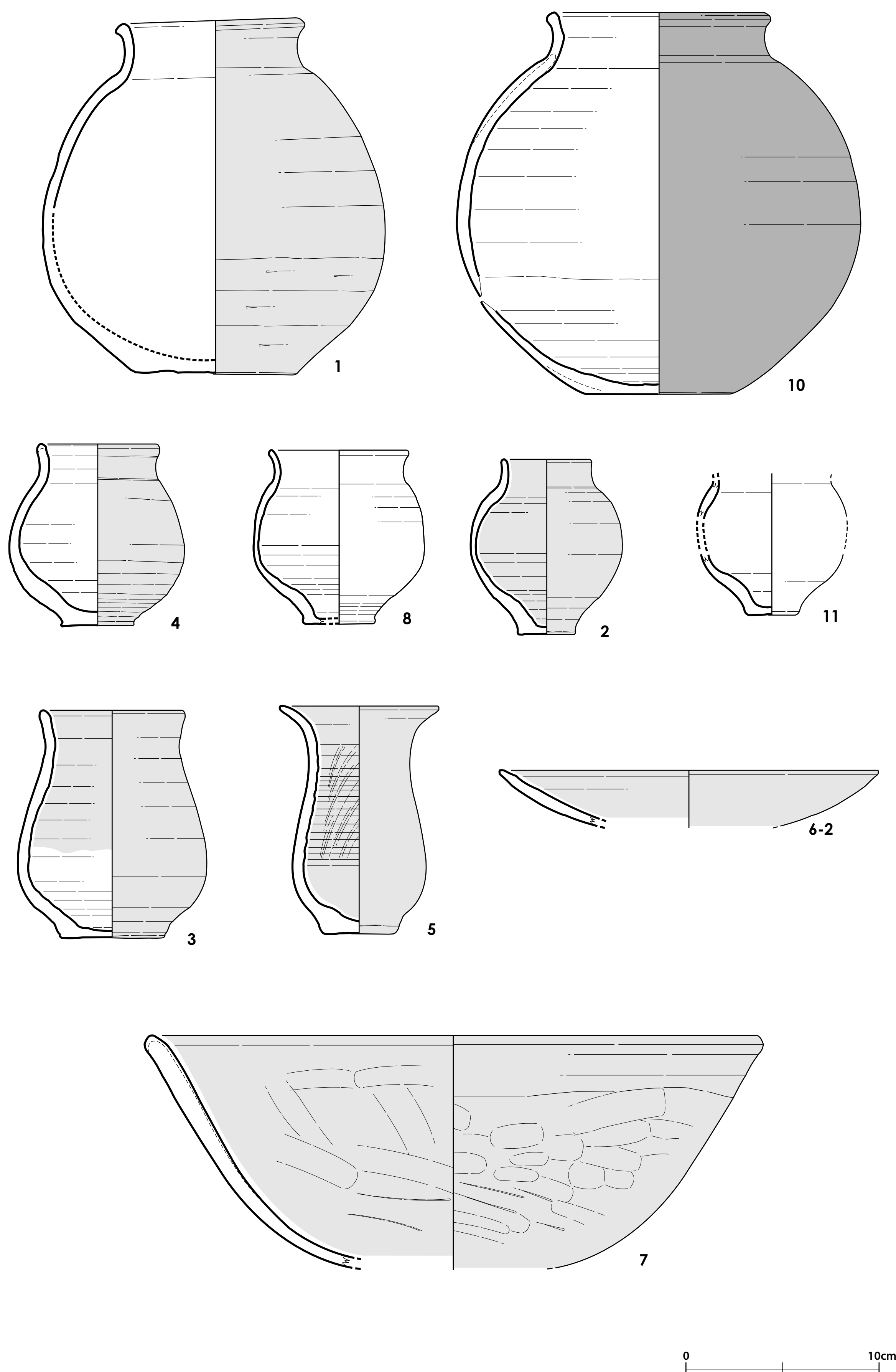


Figure 9.97 Pottery from Burial no.40 (1:3)

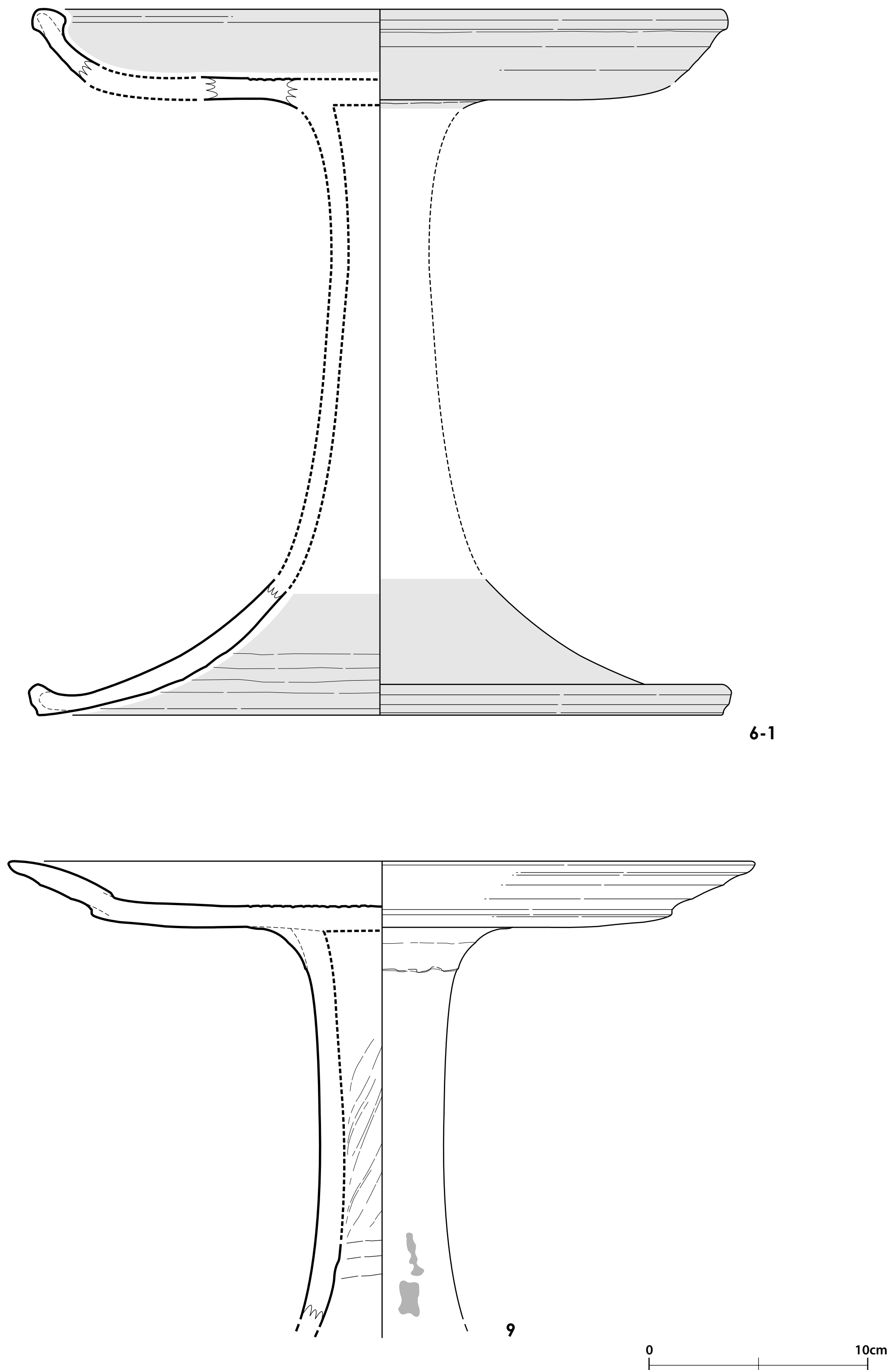


Figure 9.98　Pottery from Burial no.40 (1:3)



Figure 9.99 Pottery from Burial no.40

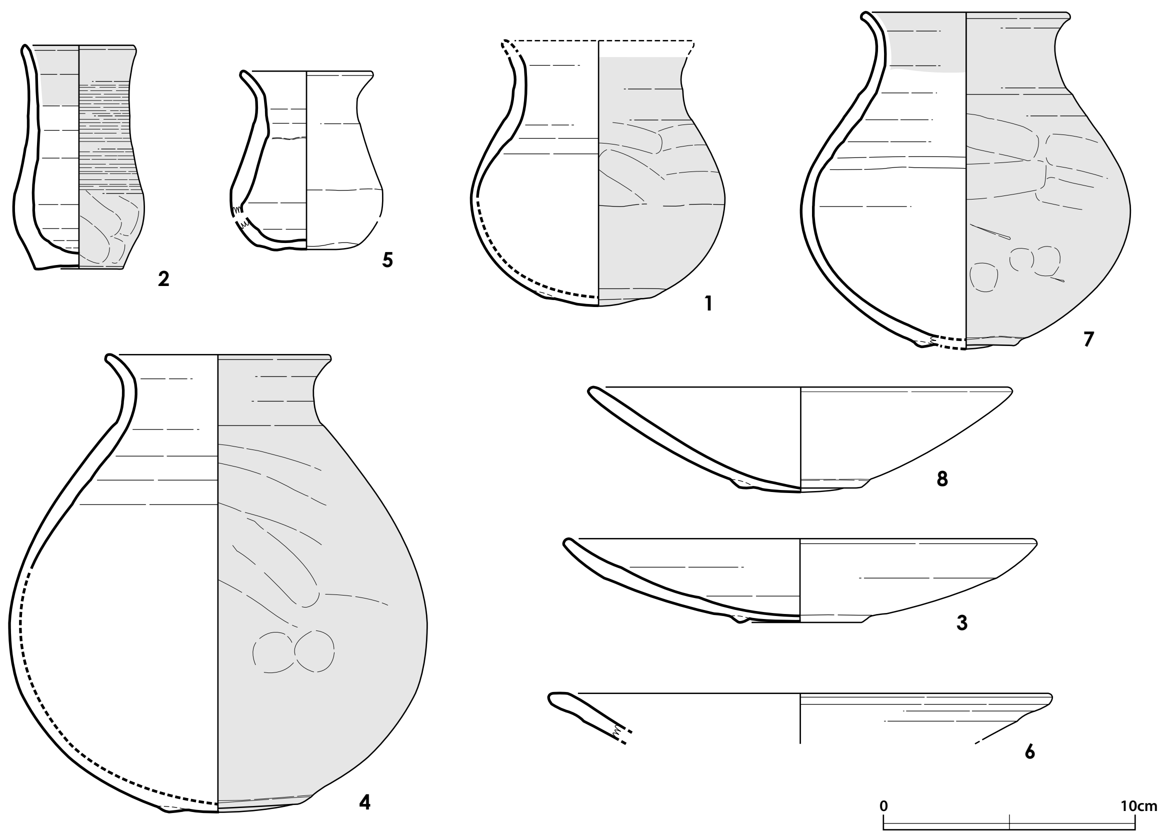


Figure 9.100 Pottery from Burial no.41 (1:3)









Figure 9.101 Pottery from Burial no.41

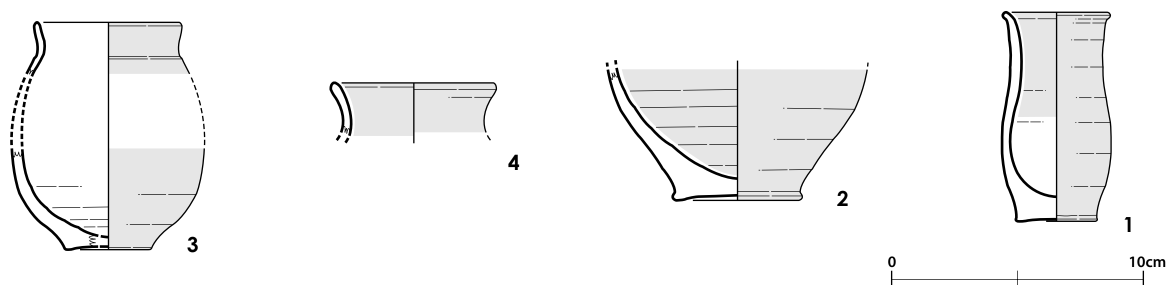


Figure 9.102 Pottery from Burial no.44 (1:3)

Figure 9.103 Pottery from Burial no.48 (1:3)

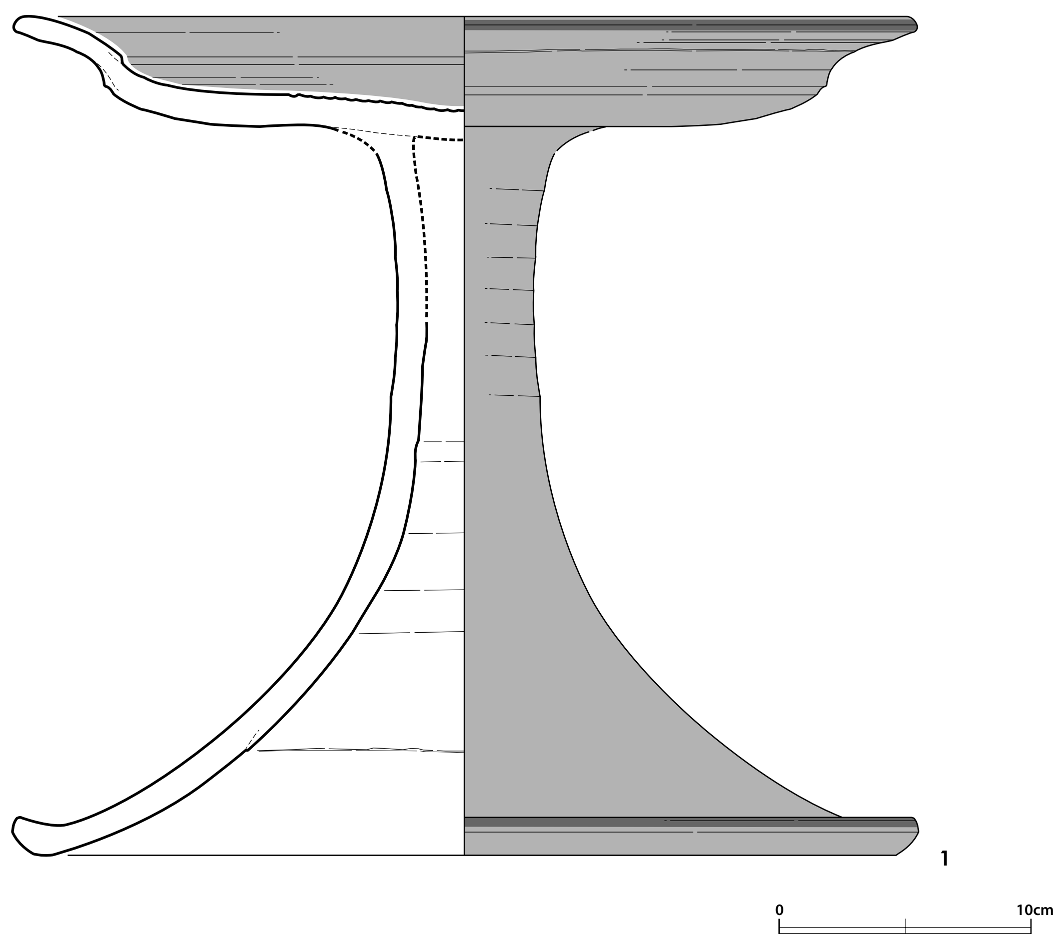


Figure 9.104 Pottery from Burial no.48 (1:3)

















Figure 9.105 Pottery from Burial no.48

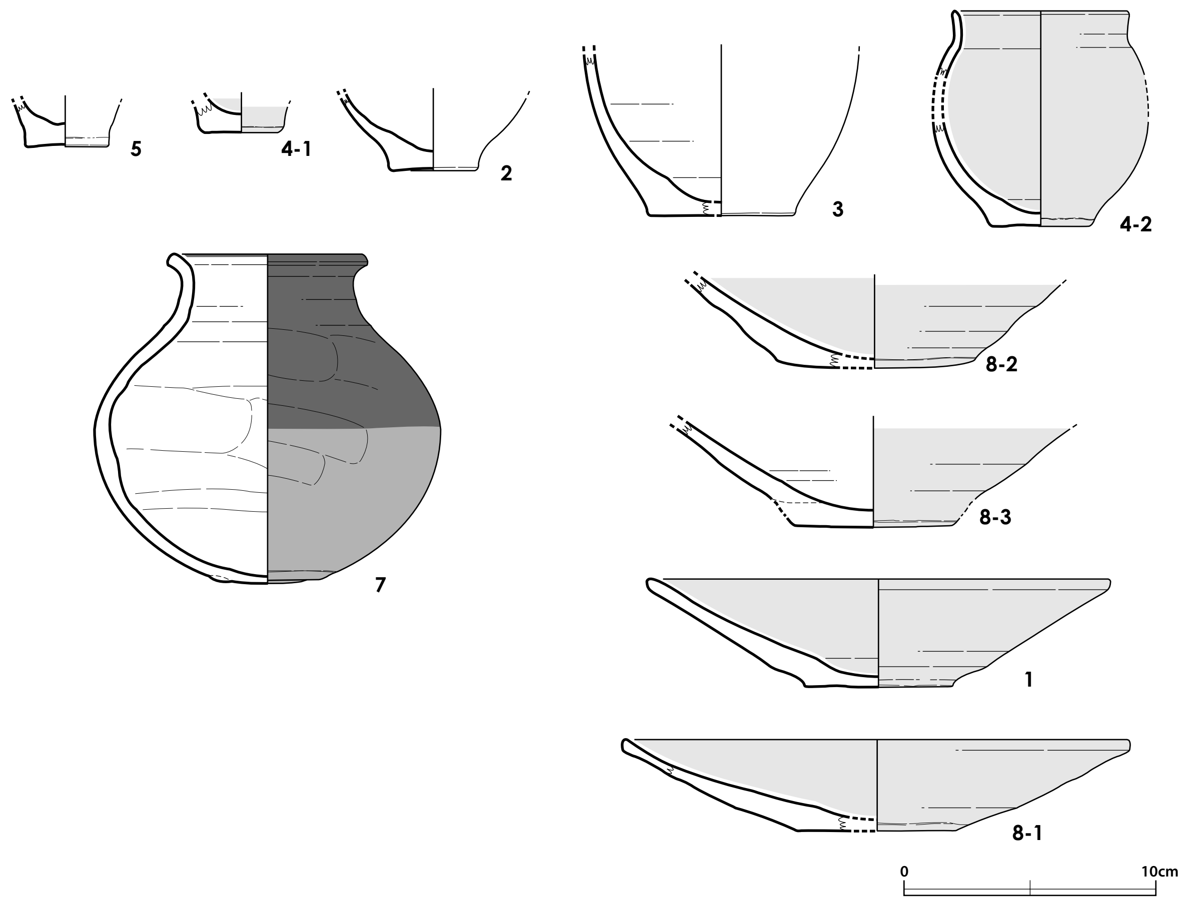


Figure 9.106 Pottery from Burial no.49 (1:3)



Figure 9.107 Pottery from Burial no.49

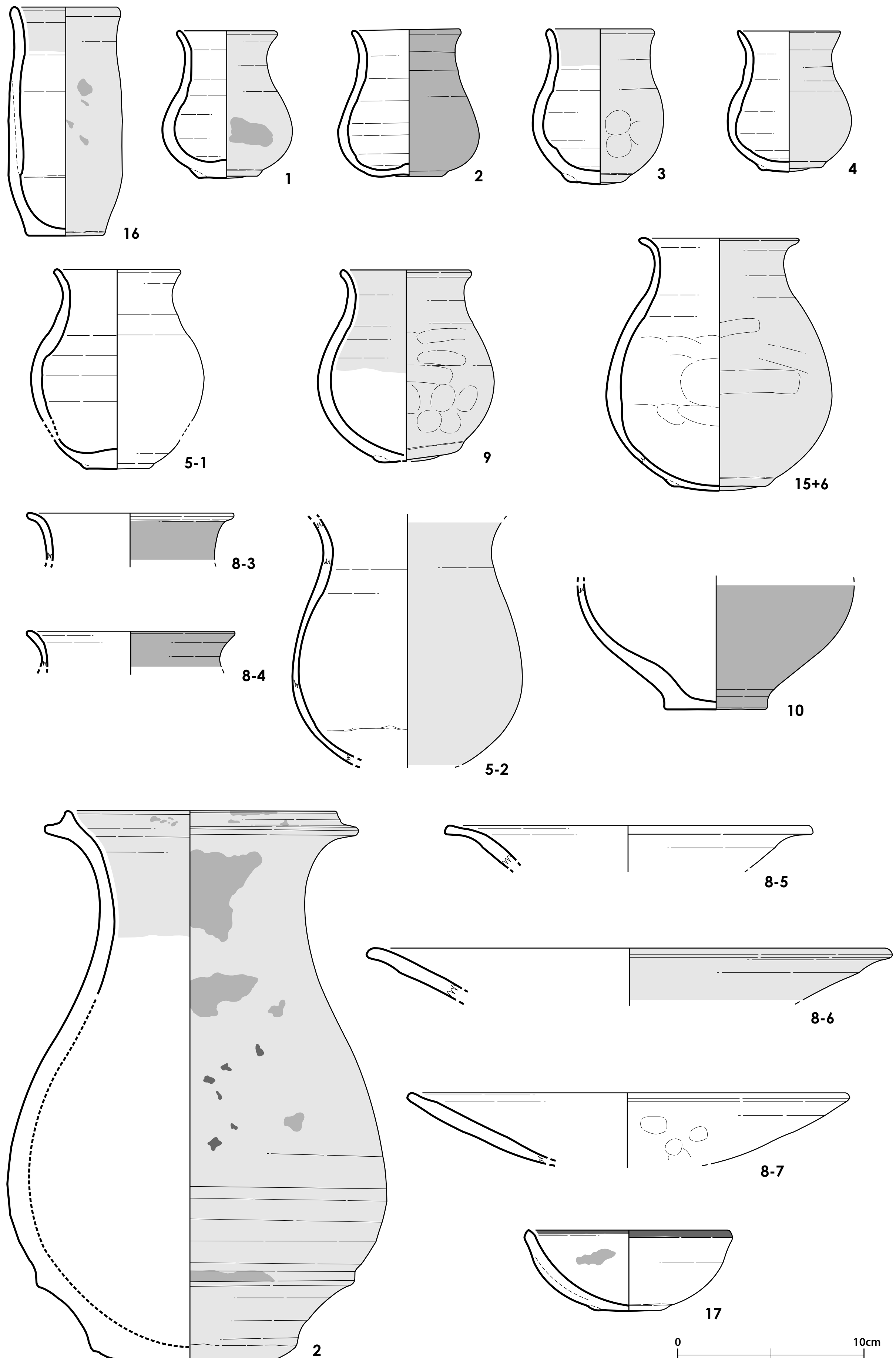


Figure 9.108 Pottery from Burial no.50A (1:3)

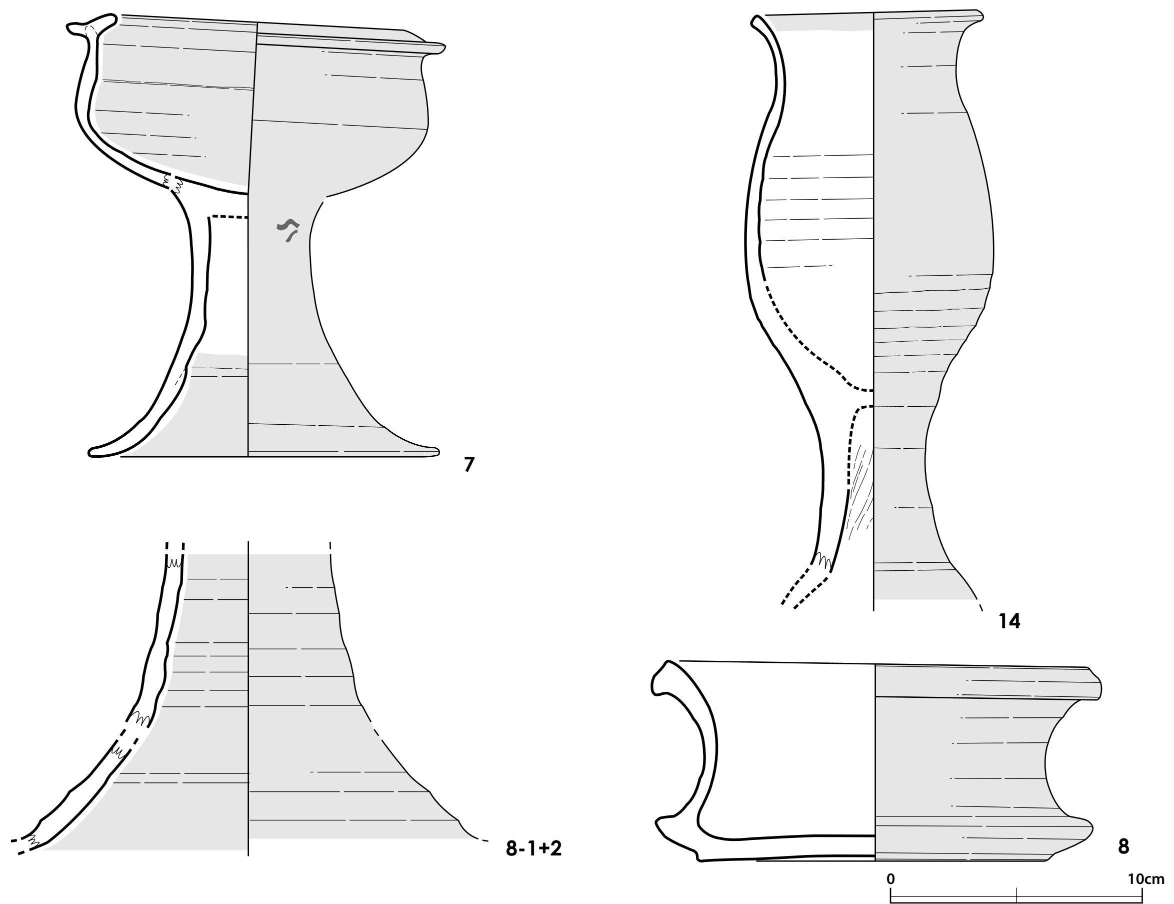


Figure 9.109 Pottery from Burial no.50A (1:3)



Figure 9.110 Pottery from Burial no.50A

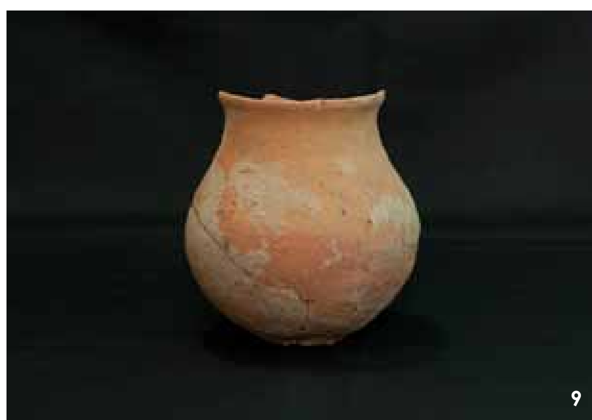
















Figure 9.111 Pottery from Burial no.50A

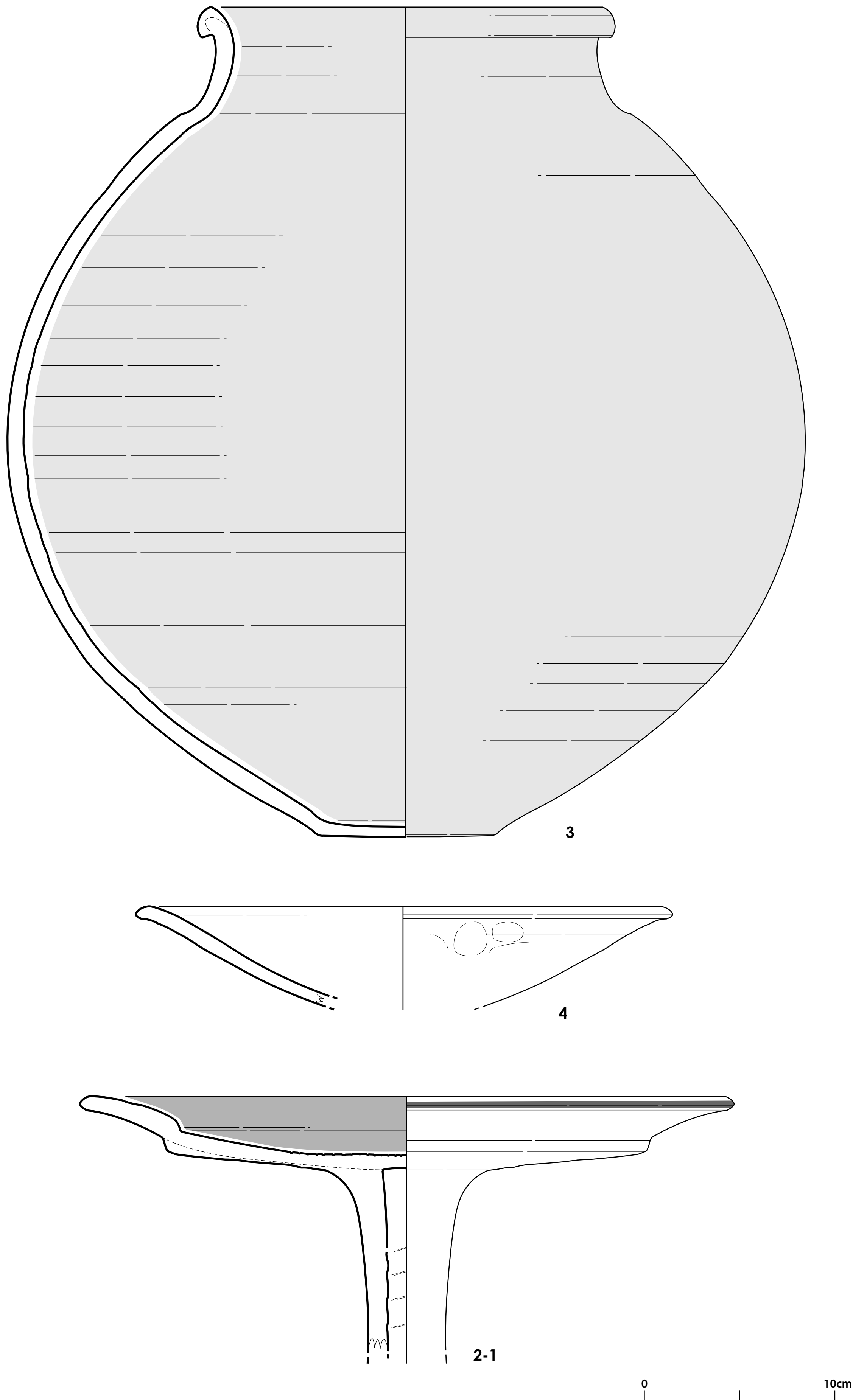


Figure 9.112 Pottery from Burial no.50B (1:3)

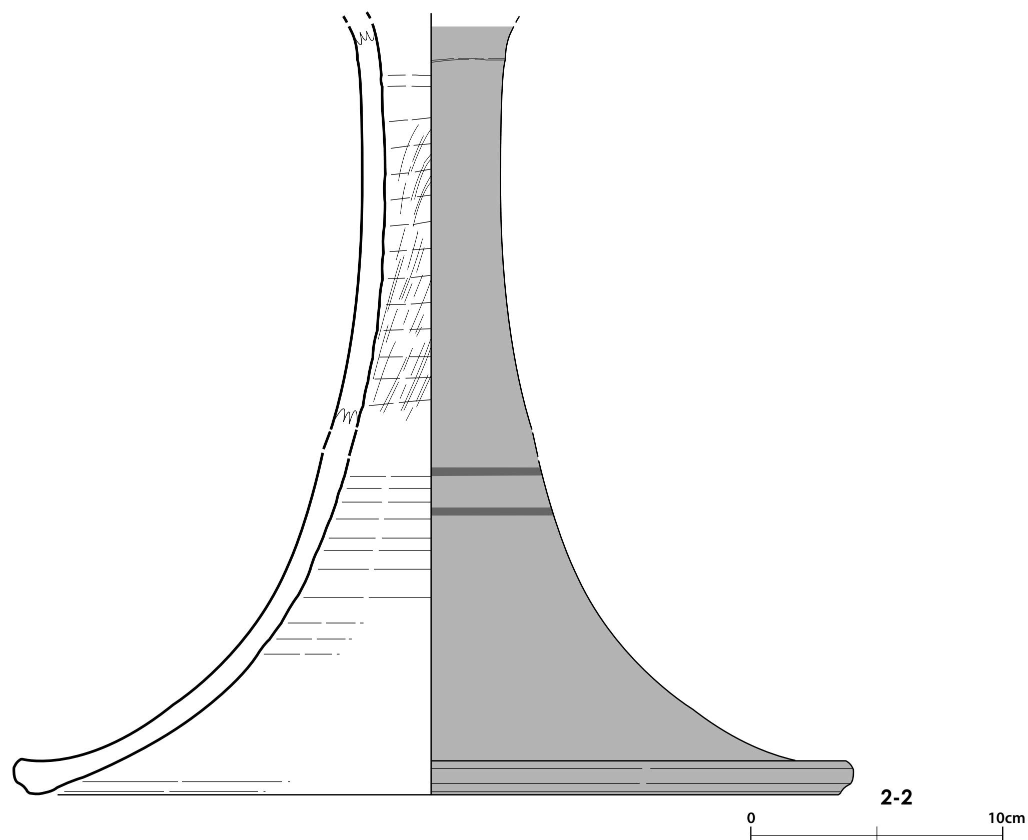


Figure 9.113 Pottery from Burial no.50B (1:3)









Figure 9.114 Pottery from Burial no.50B

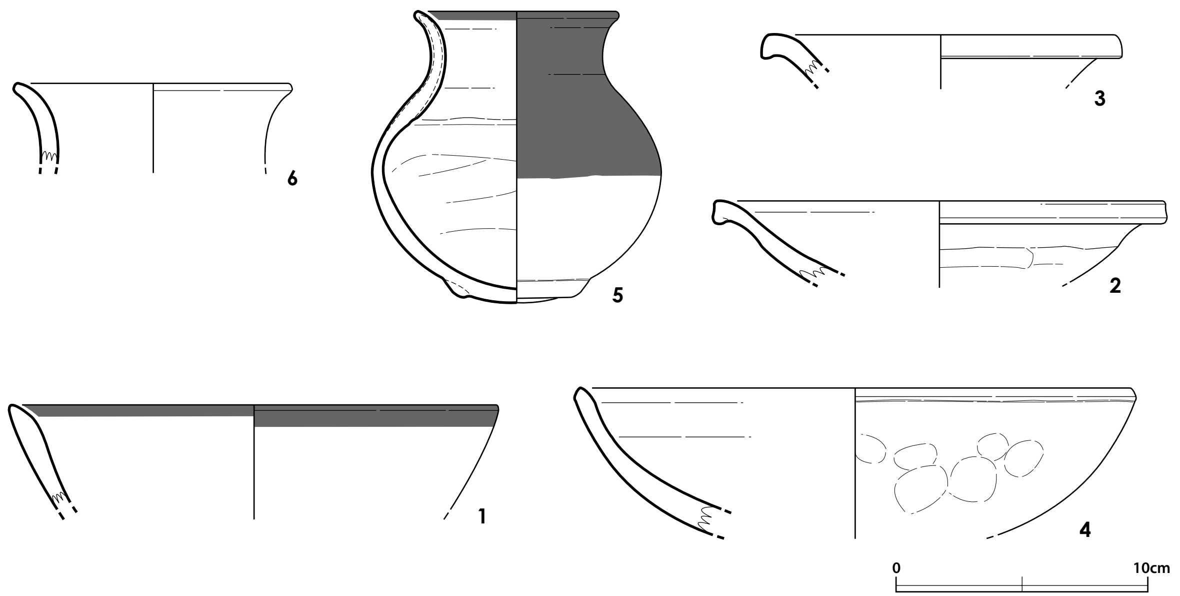


Figure 9.115 Pottery from Burial no.52 (1:3)



Figure 9.116 Pottery from Burial no.52

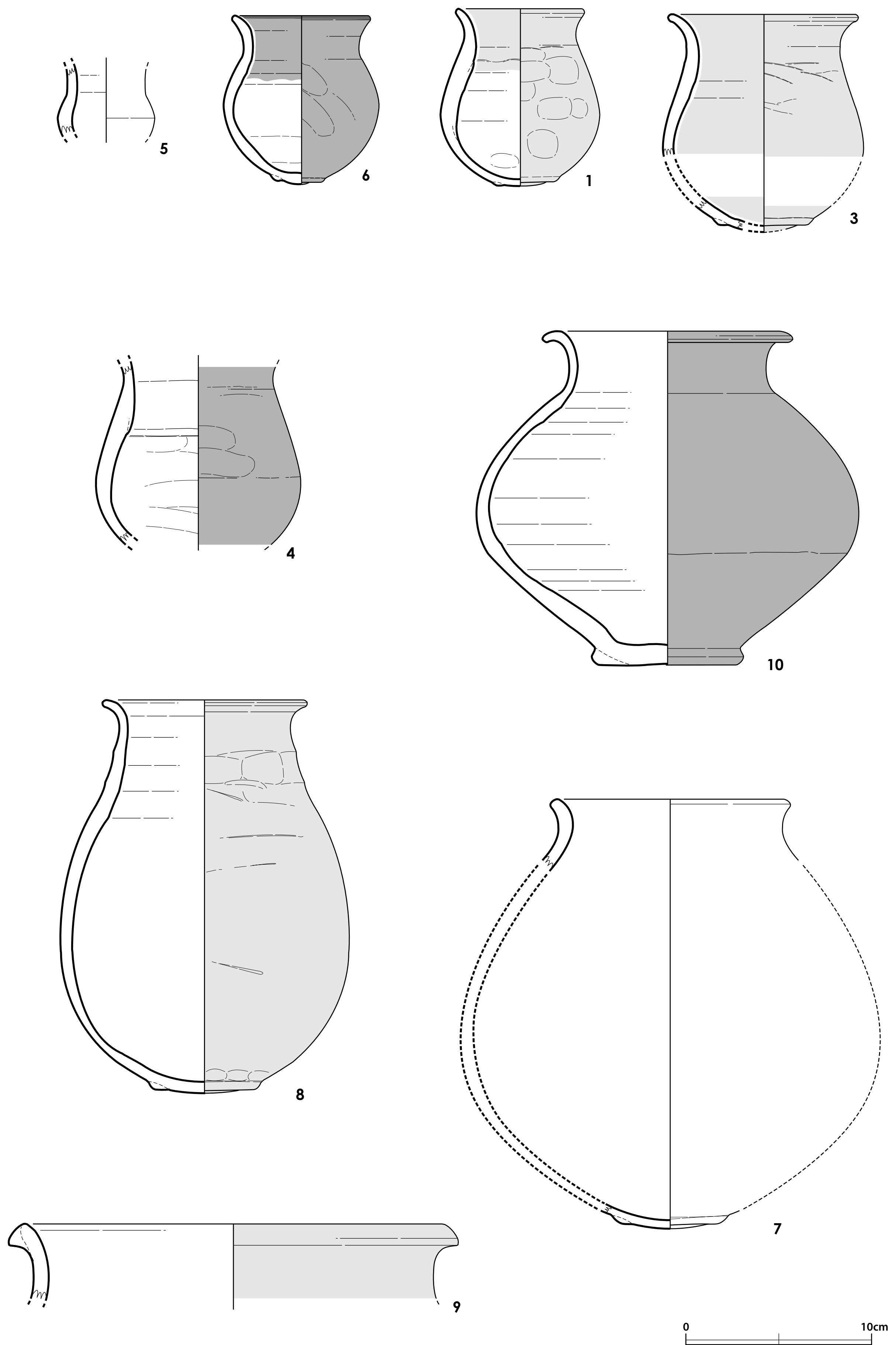


Figure 9.117 Pottery from Burial no.53 (1:3)

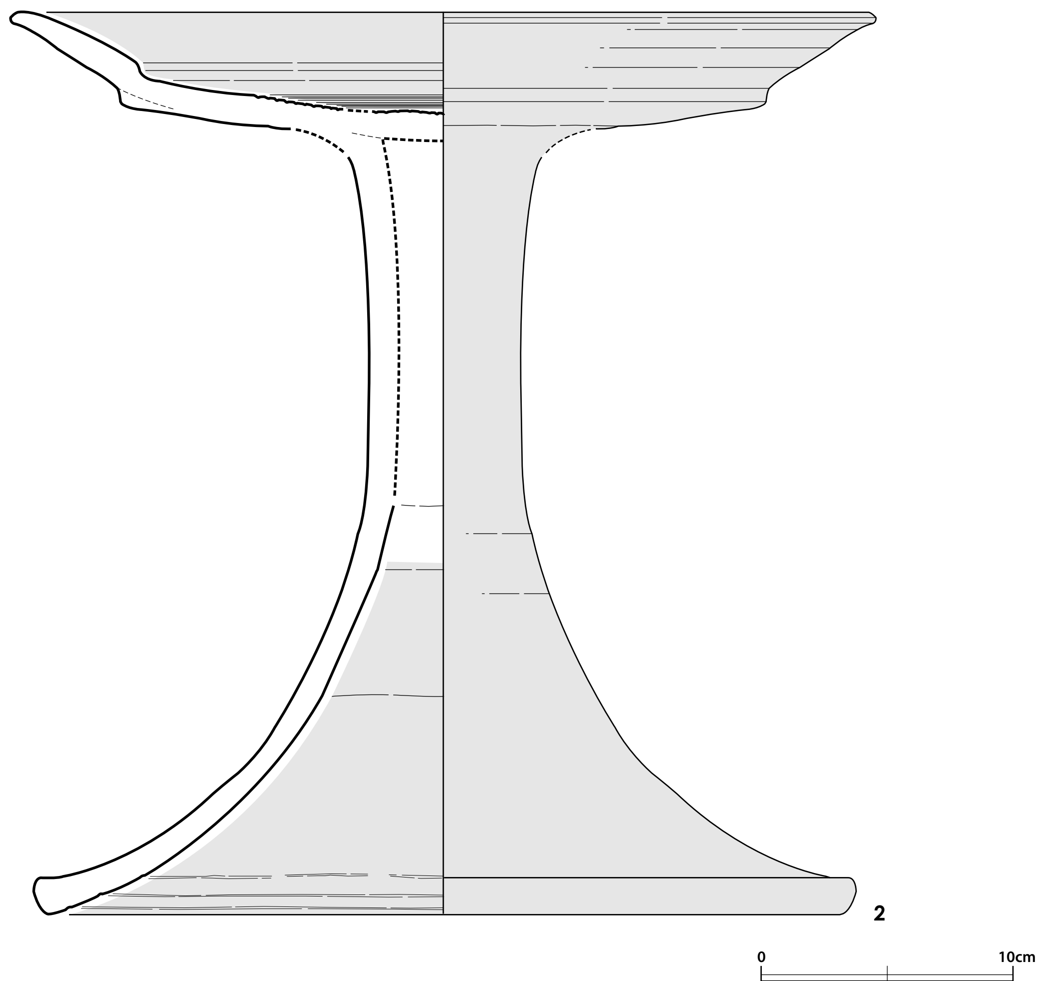


Figure 9.118 Pottery from Burial no.53 (1:3)



Figure 9.119 Pottery from Burial no.53

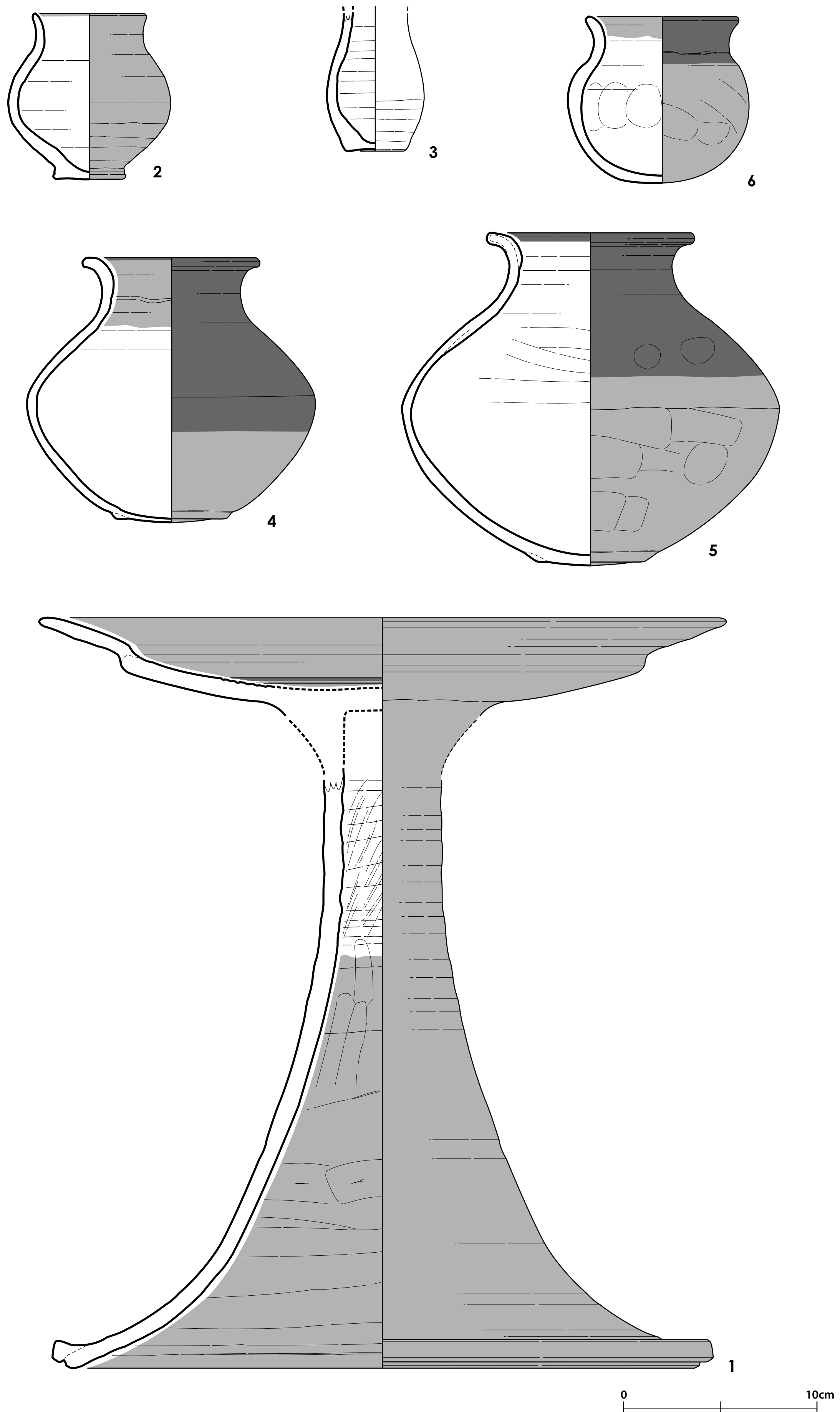


Figure 9.120 Pottery from Burial no.54 (1:3)



Figure 9.121 Pottery from Burial no.54

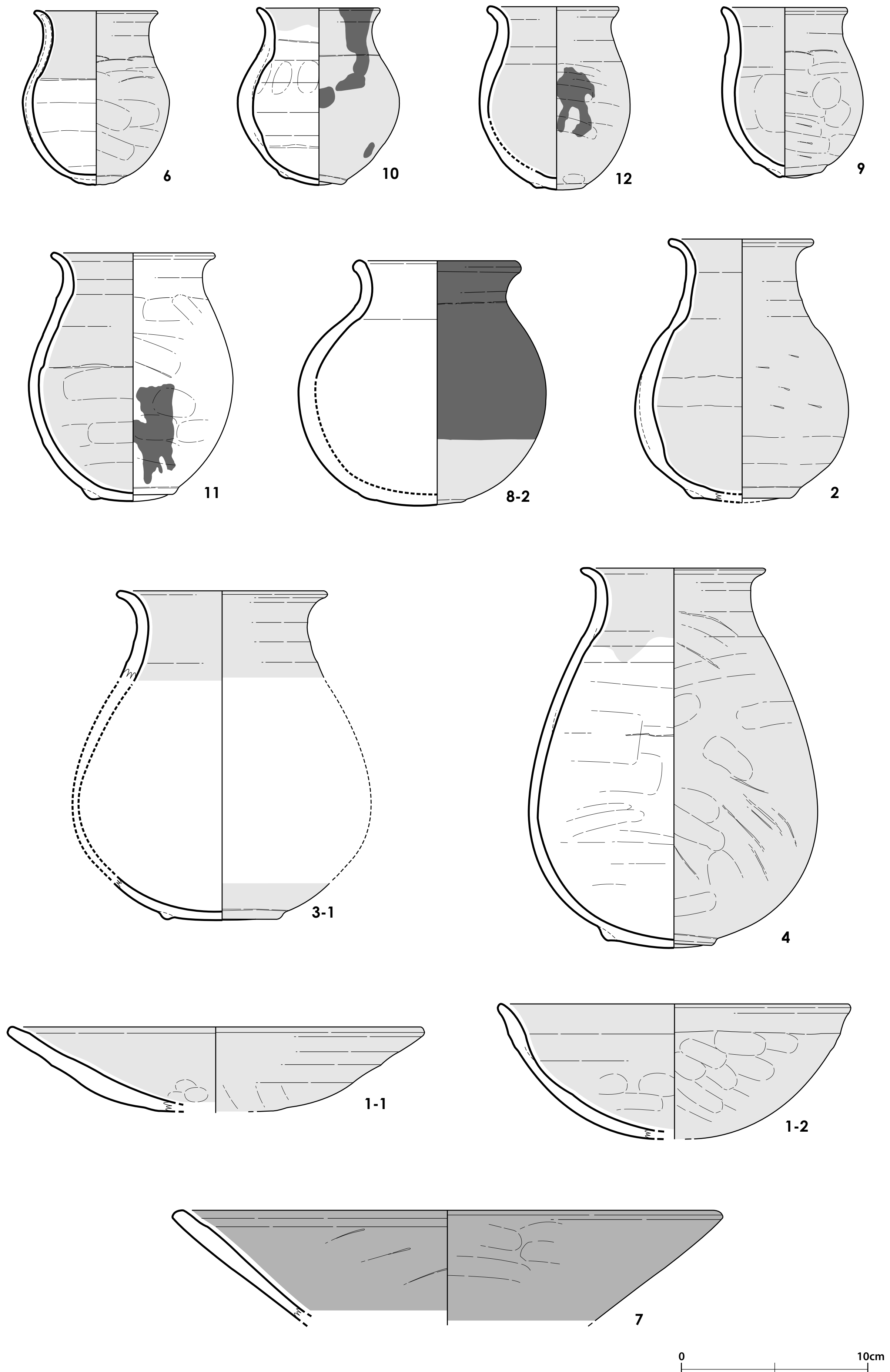


Figure 9.122 Pottery from Burial no.56 (1:3)

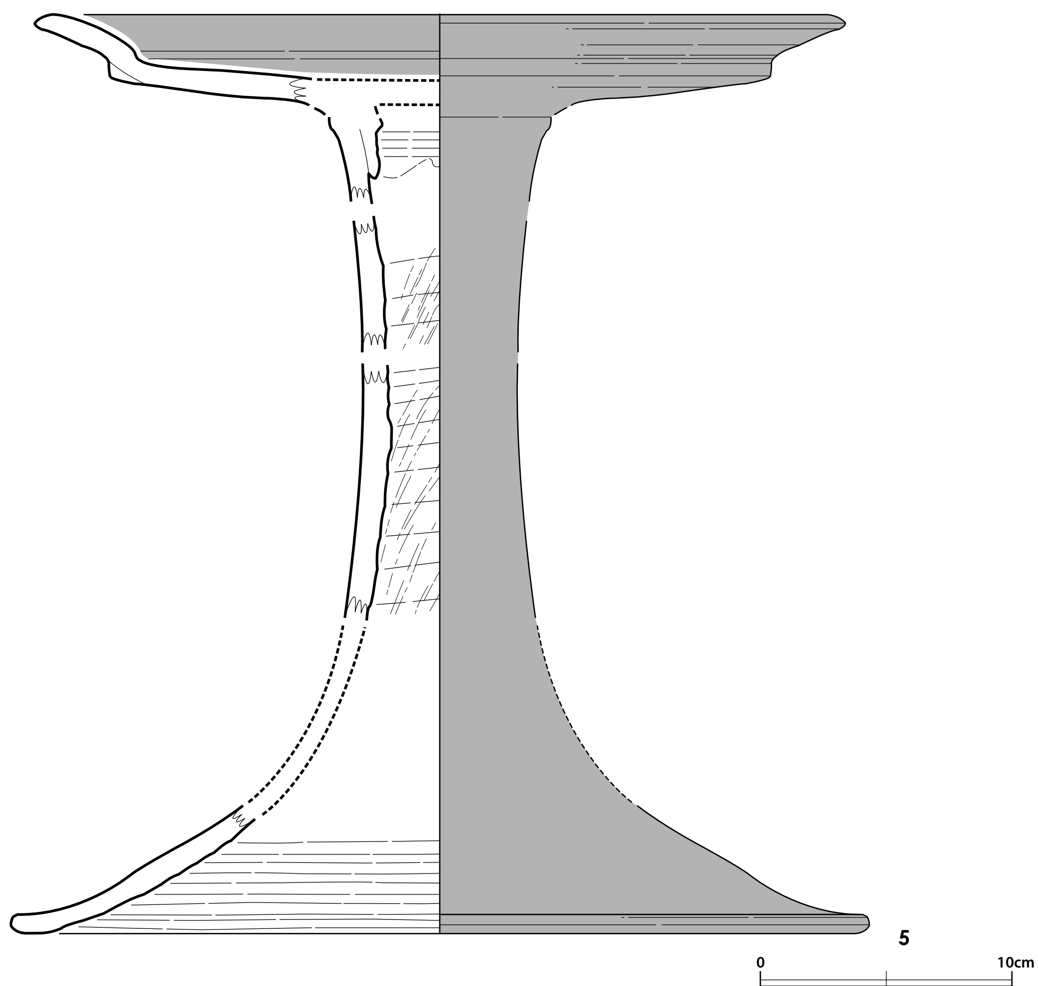


Figure 9.123 Pottery from Burial no.56 (1:3)













Figure 9.124 Pottery from Burial no.56

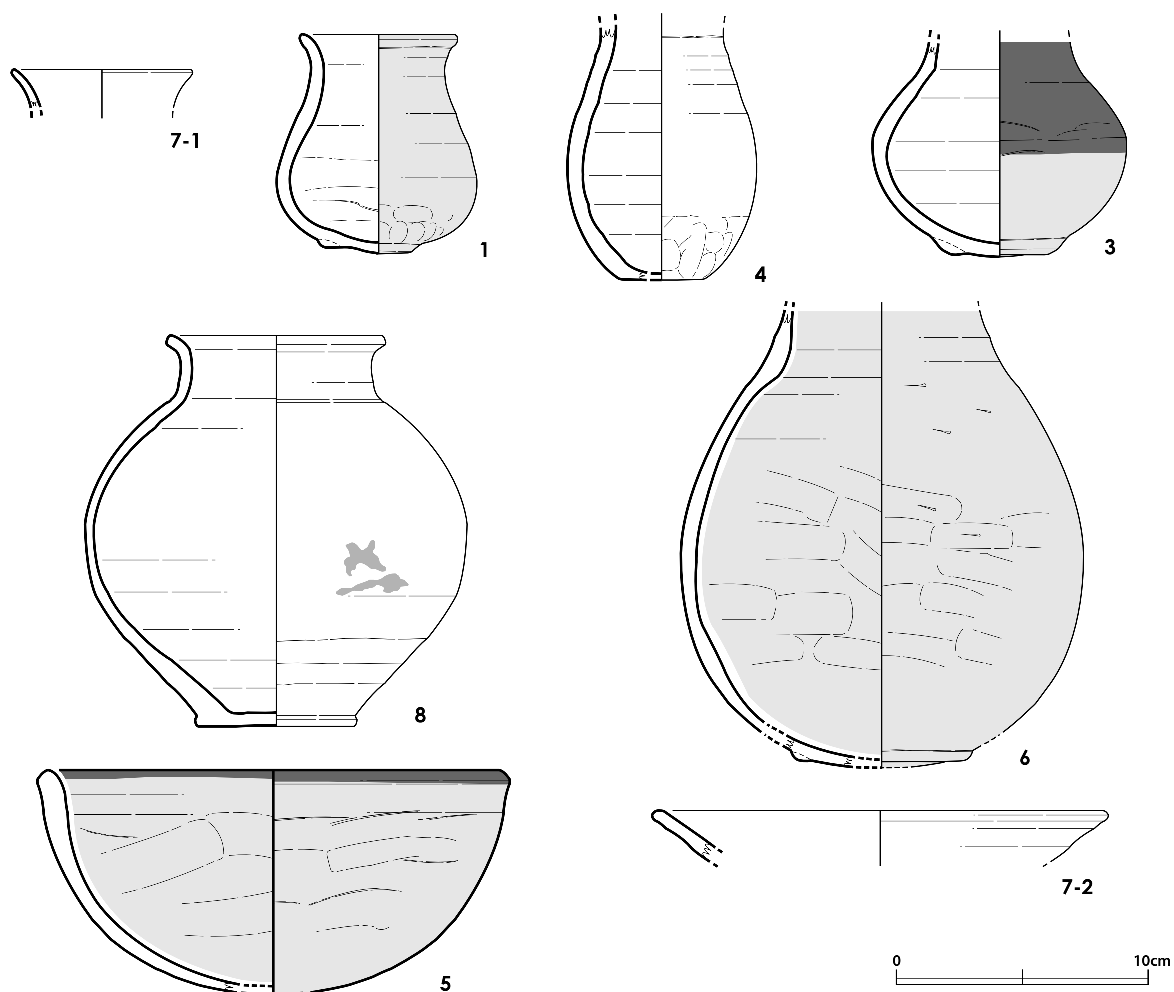


Figure 9.125 Pottery from Burial no.62 (1:3)



Figure 9.126 Pottery from Burial no.62

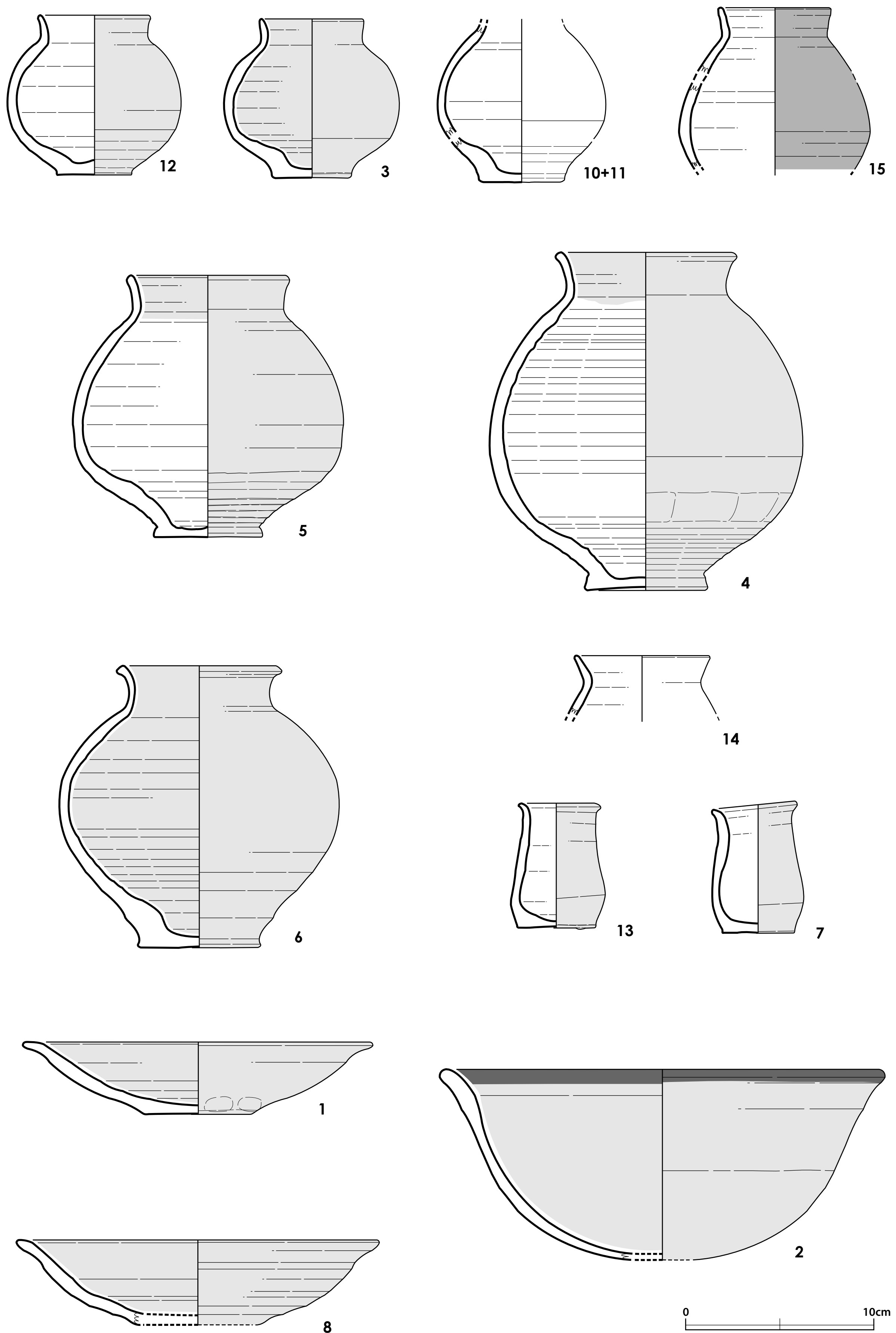


Figure 9.127 Pottery from Burial no.64 (1:3)



Figure 9.128 Pottery from Burial no.64

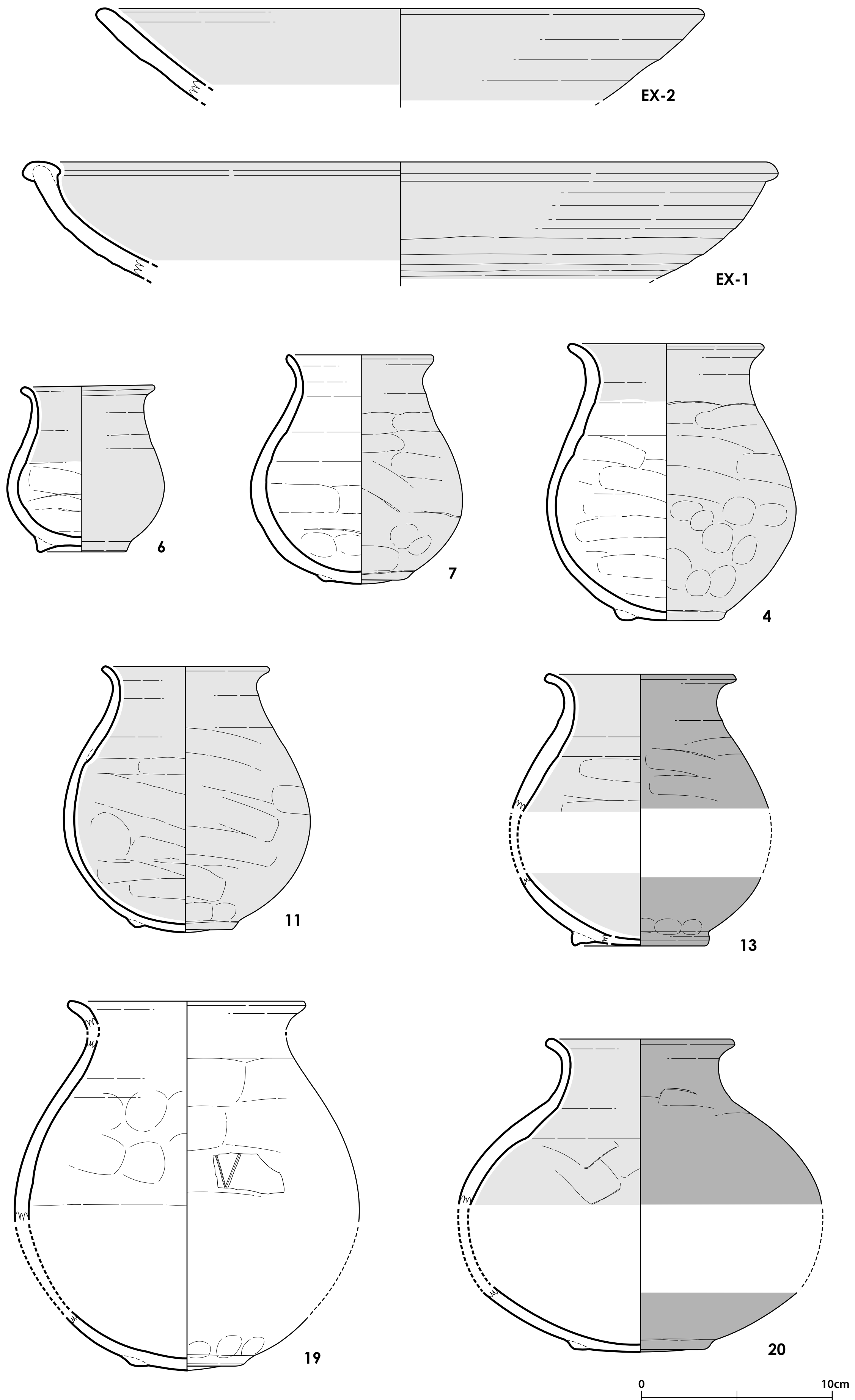


Figure 9.129 Pottery from Burial no.65 (1:3)

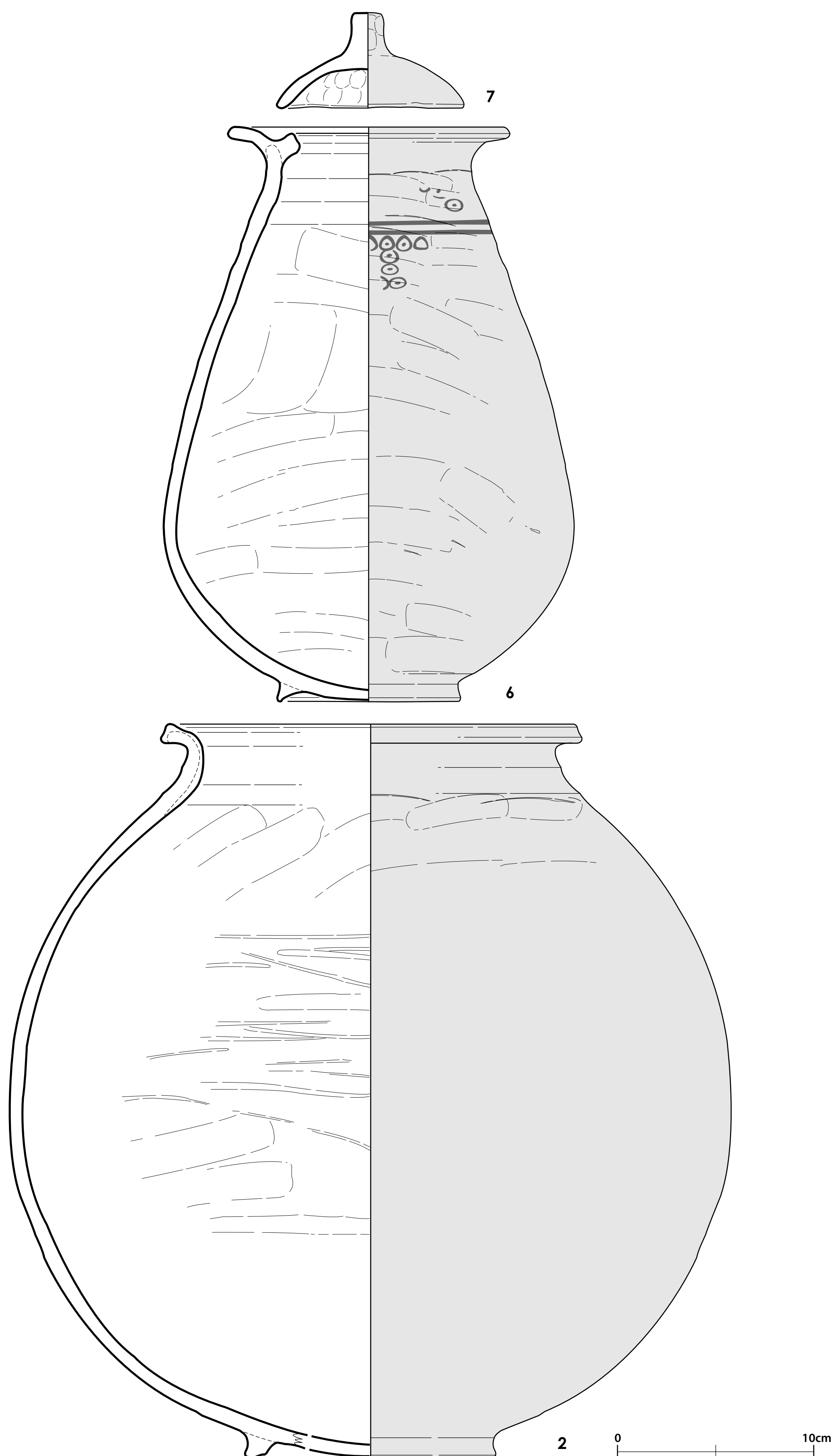


Figure 9.130 Pottery from Burial no.65 (1:3)

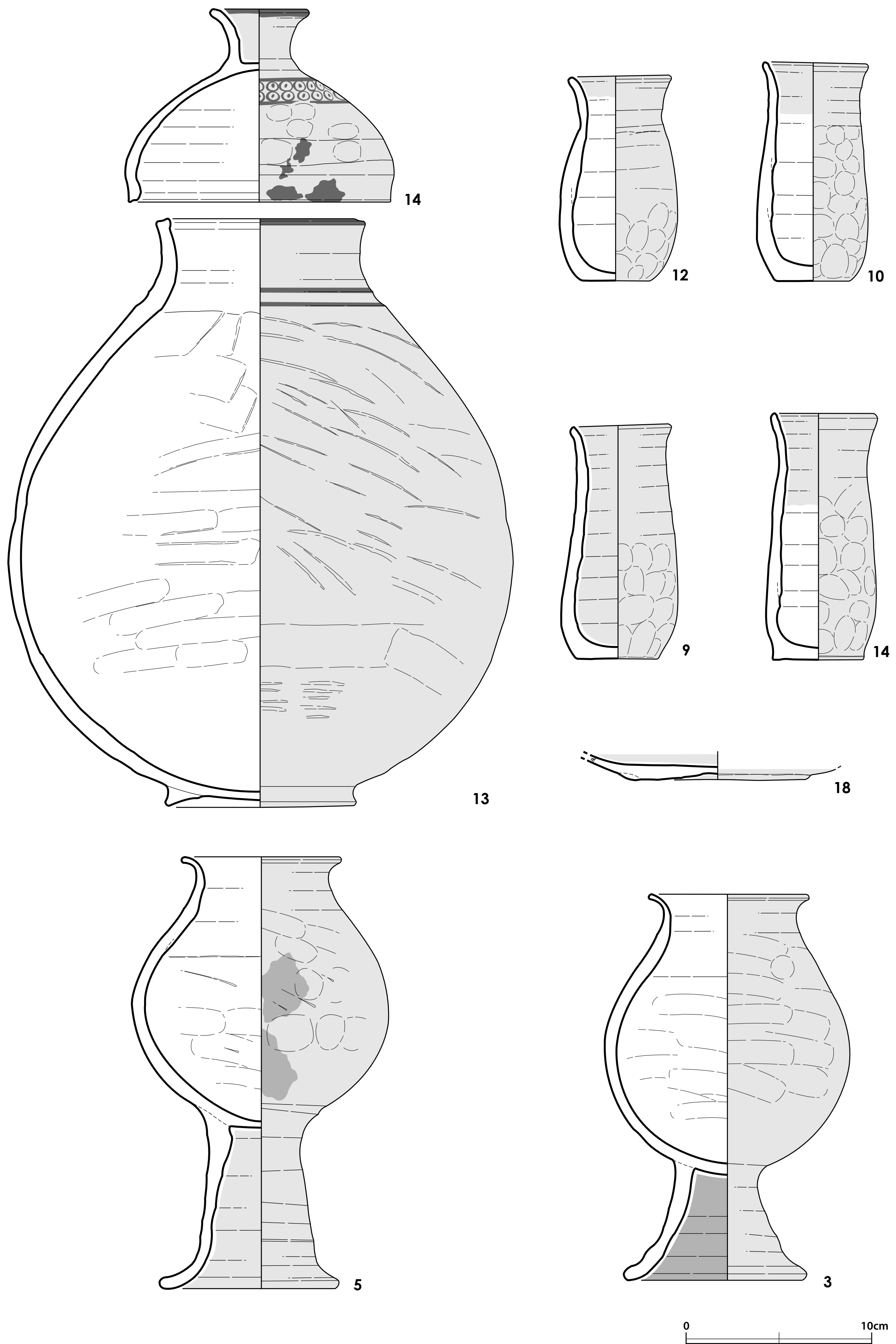


Figure 9.131 Pottery from Burial no.65 (1:3)

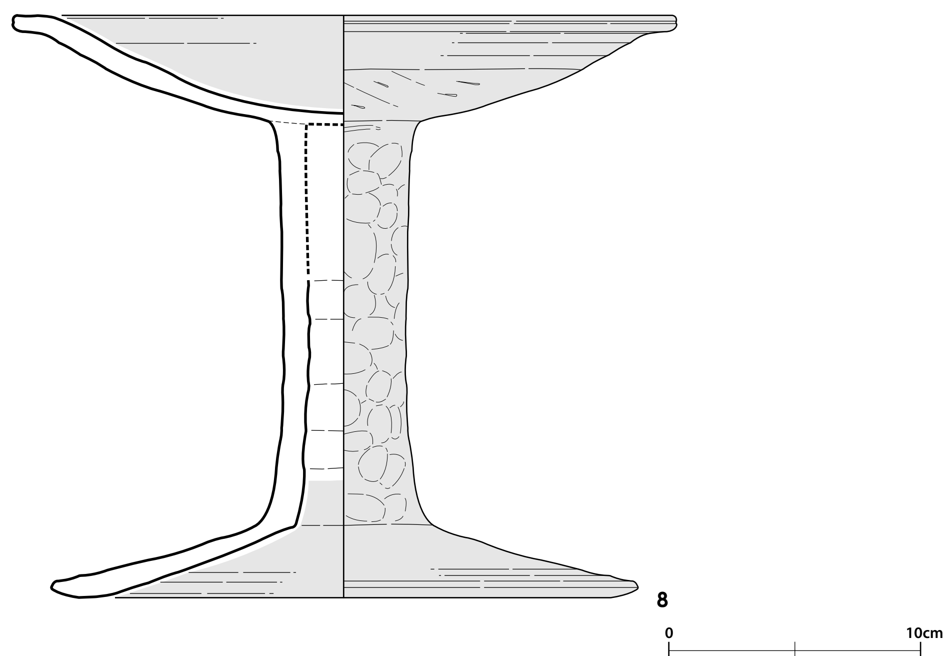


Figure 9.132 Pottery from Burial no.65 (1:3)









Figure 9.133 Pottery from Burial no.65

















Figure 9.134 Pottery from Burial no.65

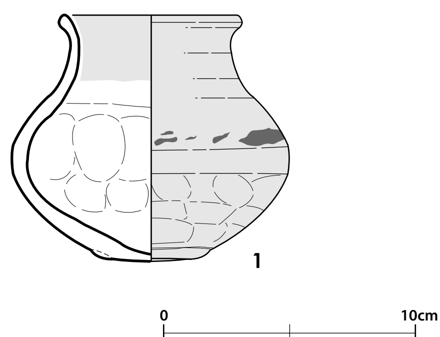




Figure 9.135 Pottery from Burial no.66 (1:3)

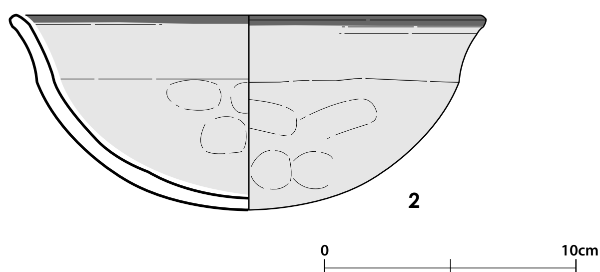


Figure 9.136 Pottery from Burial no.67 (1:3)

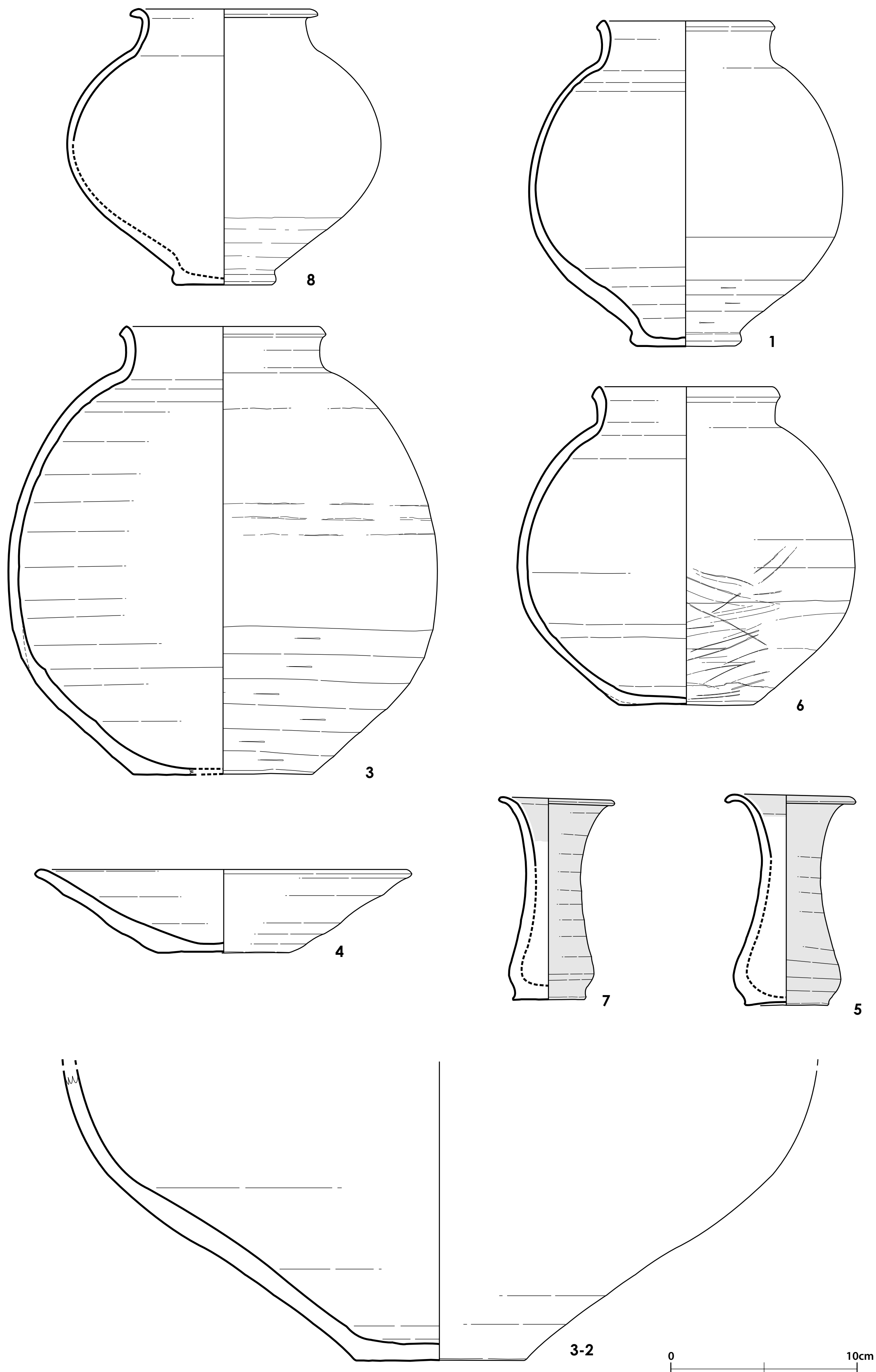


Figure 9.137 Pottery from Burial no.68 (1:3)

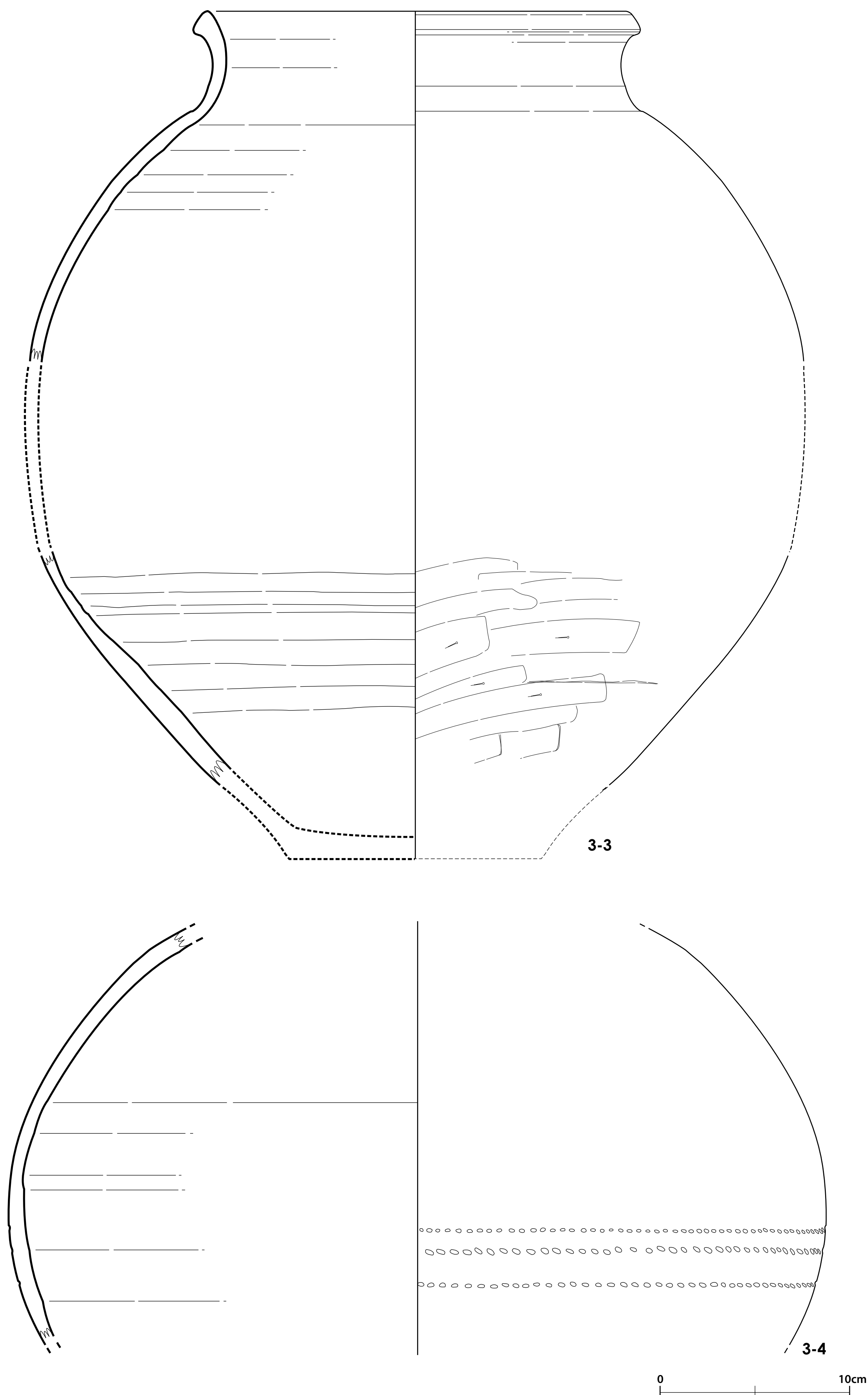
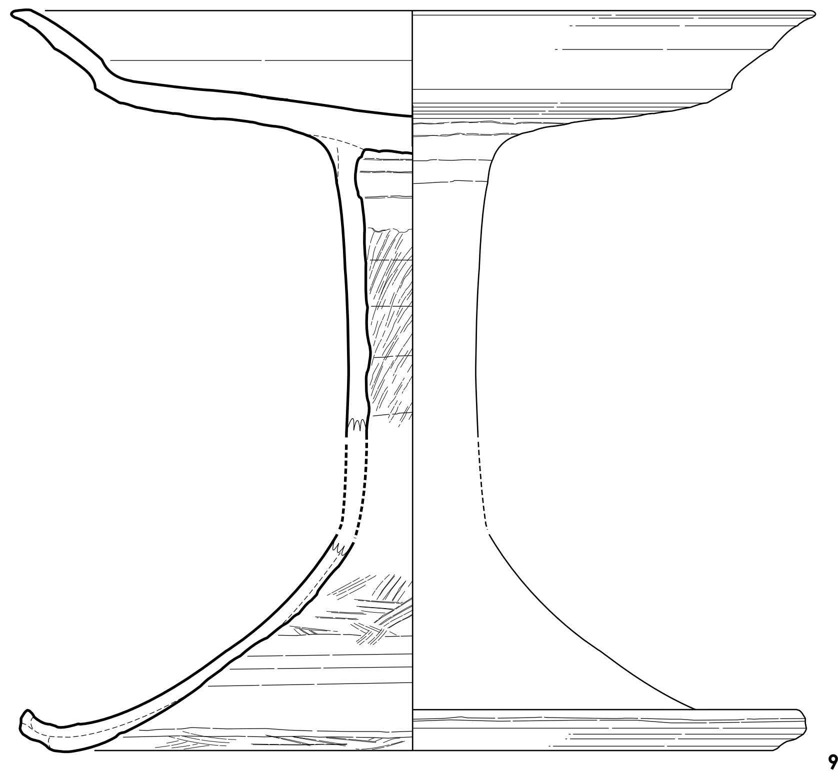
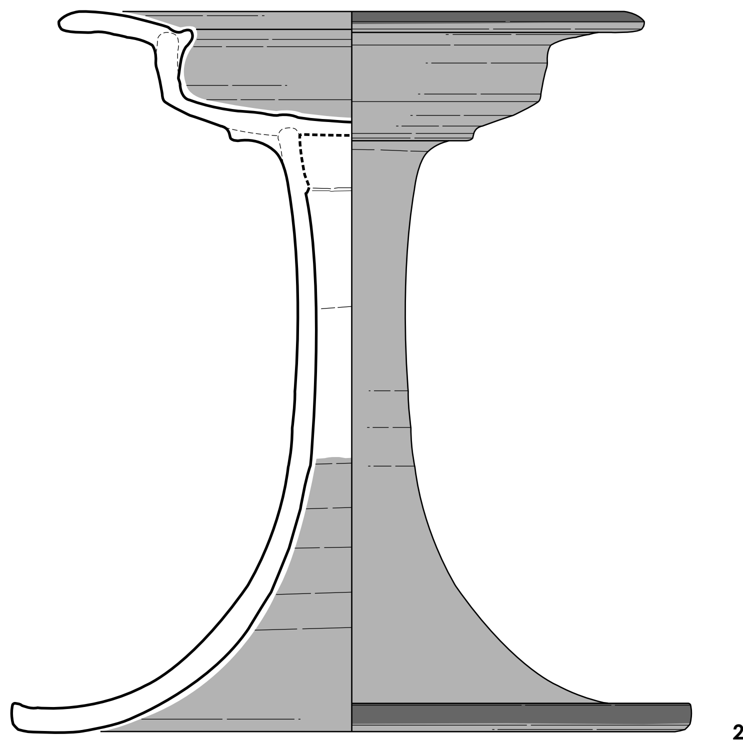


Figure 9.138 Pottery from Burial no.68 (1:3)





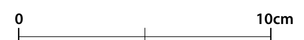


Figure 9.139 Pottery from Burial no.68 (1:3)

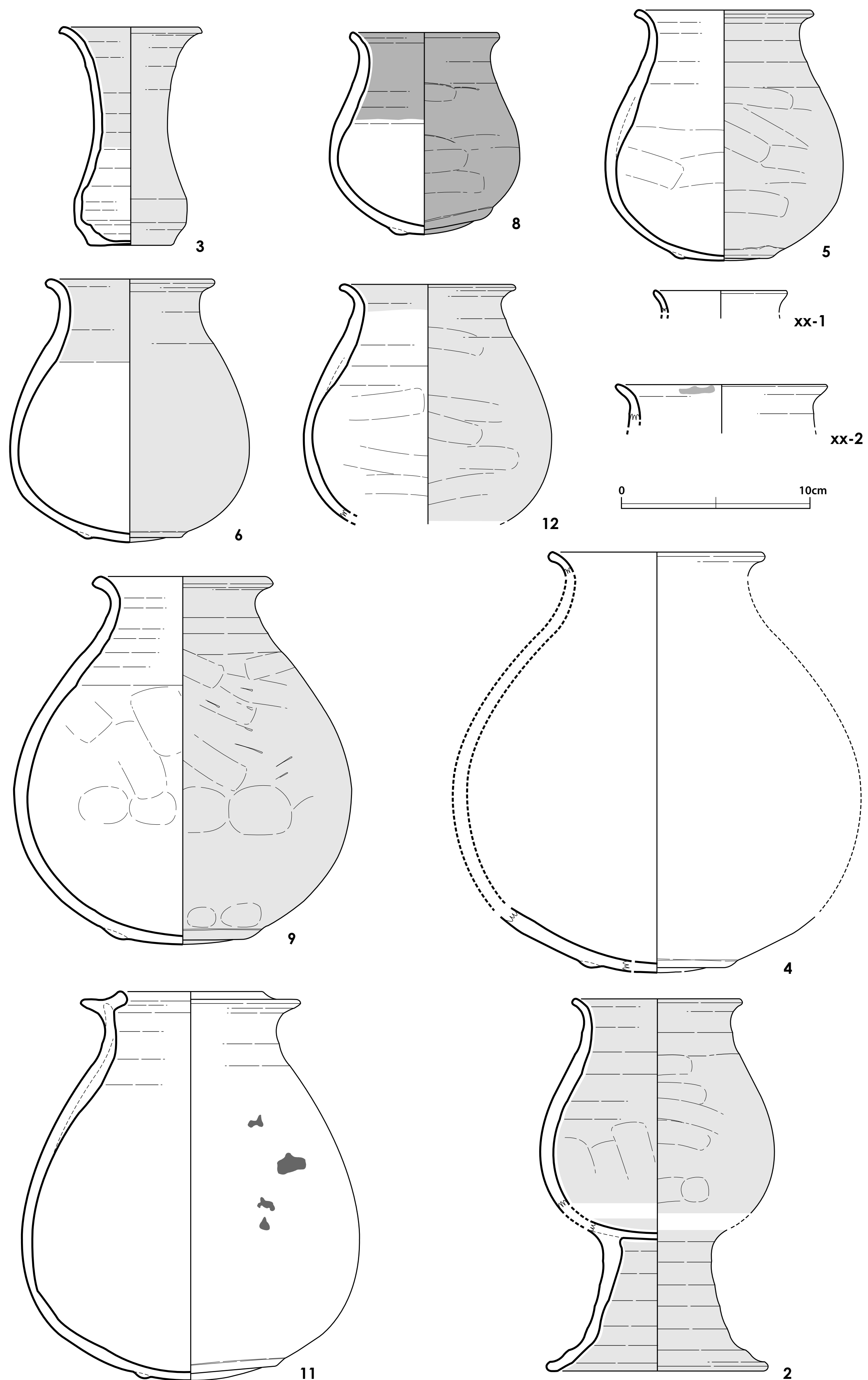


Figure 9.140 Pottery from Burial no.70 (1:3)

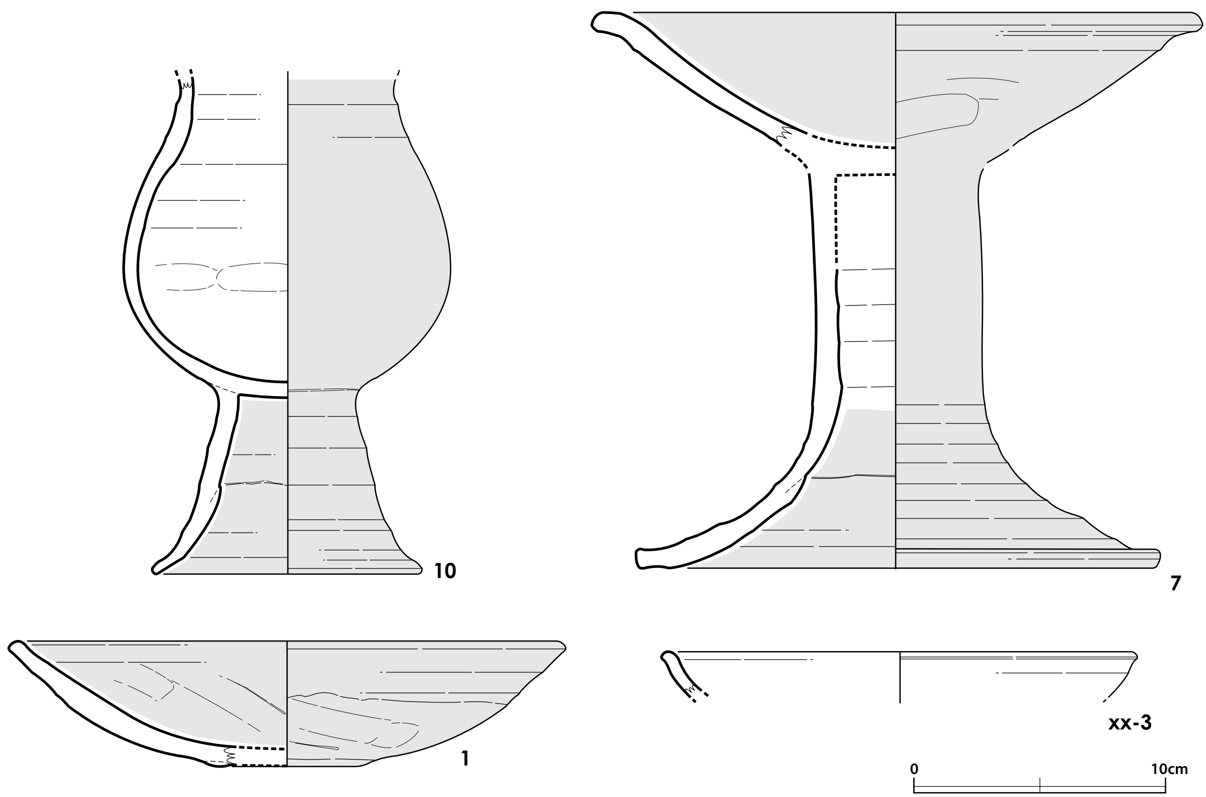


Figure 9.141 Pottery from Burial no.70 (1:3)



Figure 9.142 Pottery from Burial no.70

CHAPTER 10

COMPOSITIONAL AND MICROSTRUCTURAL ANALYSIS OF COPPER WARES EXCAVATED AT FARMANA

by Takekazu Nagae

Abstract

This report concerns a study of copperware objects excavated at Farmana. All of the objects were severely corroded on the surface. From the 31 objects excavated, 22 remained slightly uncorroded internally, and a sufficient amount of material was available for compositional analysis and microstructural observations. The results indicated that 20 of the objects were composed mainly of copper whereas 2 were made of brass. They were all made by forging of a cast alloy plate and subsequent annealing.

1 INTRODUCTION

Excavated copper wares give us very important information about technology during ancient times. We can determine, for example, where the raw material was produced, how it was formed, and whether it was heat treated or not. In this report, chemical analyses and microstructural observations were carried out on copper wares excavated at Farmana in northern India in order to reveal how they were produced. The forming method (casting or forging) and the heat treatment used were clarified for each object.

2 SAMPLES AND EXPERIMENTAL METHODS

The objects for analysis are listed in Table 10.1. They include rings, bangles, rods, arrow heads and axes. All were covered with a thick corrosion layer. Although a total of 31 objects were excavated, only 22 of them contained any remaining uncorroded metal. A small sample was cut from the interior of these objects to observe the uncorroded metal region. These samples were mounted in resin and their surfaces were polished to remove all scratches. The resulting mirror-like surfaces were etched using a solution of 60 ml of ethanol, 10 ml of hydrochloric acid, 30 ml of distilled water and 2 g of ferric chloride.

Samples for metallographic observation were examined by optical microscopy (OM) and scanning electron microscopy (SEM) in conjunction with energy dispersive X-ray spectroscopy (EDS). Chemical compositions were quantified by EDS.

3 CHEMICAL COMPOSITIONS

The major chemical compositions determined by EDS analysis are shown in Table 1. No compositional data is shown for samples FRN-4, 10, 13, 15, 16, 17, 19, 21 and 24 because these samples were severely corroded and no metal regions remained. Most of the analyzed samples (except for FRN-9 and 29) are made of almost pure copper containing a small amount of impurities or alloying elements. Samples FRN-1, 5, 12, 14, 18, 20, 23, 25, 27, 28 and 30 contain arsenic. It is difficult to judge whether this arsenic was originally present in the copper ore or if it was intentionally added as an alloying element. Arsenic is known to

Table 10.1 Characteristics of the samples

No.	Object	length (cm)	width (cm)	weight (g)	Chemical composition (%)						
					S	Fe	Ni	Cu	Zn	As	Sn
FRN- 1	Ring	1.20	2.20	0.6	–	–	–	98	–	2	–
FRN- 2	Bangle	1.45	3.35	9.1	–	–	–	100	–	–	–
FRN- 3	Arrow head	3.15	2.25	12.5	–	–	–	100	–	–	–
FRN- 4	Ring	3.00	3.35	4.9	–	–	–	–	–	–	–
FRN- 5	Ring	1.68	1.65	0.4	–	–	–	98	–	1	–
FRN- 6	Ring	2.18	2.45	1.4	0.9	–	–	99	–	–	–
FRN- 7	Ring	1.00	1.23	0.6	–	–	–	100	–	–	–
FRN- 8	Fish hook	3.65	1.35	2.4	–	–	–	100	–	–	–
FRN- 9	Bangle	5.50	6.90	22.3	0.4	1	–	81	14	–	3
FRN- 10	Rod?	3.10	0.90	3.2	–	–	–	–	–	–	–
FRN- 11	Rod	10.17	1.02	37.2	0.5	0.3	–	99	–	–	–
FRN- 12	Rod	8.73	0.80	17.1	–	–	–	98	–	2	–
FRN- 13	Bangle	5.05	2.02	4.3	–	–	–	–	–	–	–
FRN- 14	Rod	8.95	0.95	16.2	–	–	–	99	–	0.5	–
FRN- 15	unidentified	7.15	5.65	25.0	–	–	–	–	–	–	–
FRN- 16	Ring	2.15	2.23	2.6	–	–	–	–	–	–	–
FRN- 17	Steatile beads inside the Copper	2.00	2.93	0.9	–	–	–	–	–	–	–
FRN- 18	Bangle	4.65	3.00	18.0	–	–	–	98	–	2	–
FRN- 19	Arrow head	3.57	1.55	1.9	–	–	–	–	–	–	–
FRN- 20	Bangle	4.00	1.60	13.2	0.3	0.4	–	97	–	2	–
FRN- 21	Arrow head	2.60	2.28	2.9	–	–	–	–	–	–	–
FRN- 22	Bangle	6.10	6.13	20.3		–	–	100	–		–
FRN- 23	Bangle	5.85	6.08	22.9	0.2	–	–	97	–	3	–
FRN- 24	Point	5.43	0.50	2.0	–	–	–	–	–	–	–
FRN- 25	Wire cave	4.33	6.60	2.5	–	–	–	99	–	1	–
FRN- 26	Hook?	3.70	1.95	6.1	–	–	–	100	–		–
FRN- 27	Axe	7.35	5.08	93.9	–	–	1	97	–	2	–
FRN- 28	Axe	5.85	8.15	110.0	0.5	0.6	–	95	–	4	–
FRN- 29	Bangle	2.90	3.85	3.1	–	–	–	84	16	–	–
FRN- 30	Nail?	5.30	1.35	1.1	–	–	–	99	–	0.8	–
FRN- 31	Rod	8.00	1.00	11.6	–	–	–	100	–	–	–

decrease the melting temperature of copper alloys and improve their castability. The hardness of copper alloys also increases by addition of arsenic. Thus, given their purpose, it is considered that arsenic was intentionally added when producing the arrow head (FRN-19) and the axes (FRN-27, 28).

The bangles FRN-9 and 29 have a unique composition among the copper wares listed in Table 1, in that both contain a considerable amount of zinc. Zinc changes the color of copper from red to a gold-like yellow. It also decreases its melting point and increases its hardness. Thus, we can conclude that the zinc was intentionally added in order to take advantage of these properties.

4 MICROSTRUCTURE AND FABRICATION PROCESSES

Ten samples were selected for microstructural observations to determine the fabrication process involved.

FRN-6: a ring (Figure 10.1(a))

As shown in Fig. 10.1(b), the copper matrix was a polygonal α-phase with annealing twins. The long thin transversely elongated phases correspond to Cu_2S, due to the presence of sulfur as an impurity. This ring was made by forging a cast metal plate and subsequent annealing.

FRN-8: a fish hook (Figure 10.2(a))

The micrograph shown in Fig. 10.2(b) indicates a polygonal α-phase with annealing twins. The small

Table 10.2 Summary of fabrication method

No.	Object	Characteristics of microstructure	Fabrication method	note
FRN- 6	ring	polygonal a phase with annealing twin, Cu_2S	Forging a cast metal plate and subsequent annealing	
FRN- 8	Fish hook	polygonal a phase with annealing twin, internal oxidation	Forging a cast metal plate and subsequent annealing	
FRN- 9	bangle	polygonal a phase with annealing twin, grain-boundary corrosion	Forging a cast metal plate and subsequent annealing	Brass
FRN- 11	rod	polygonal a phase with annealing twin , Cu_2S	Forging a cast metal plate and subsequent annealing	
FRN- 12	rod	polygonal a phase with annealing twin	Forging a cast metal plate and subsequent annealing	
FRN- 20	bangle	polygonal a phase with annealing twin	Forging a cast metal plate and subsequent annealing	
FRN- 23	bangle	polygonal a phase with annealing twin	Forging a cast metal plate and subsequent annealing	
FRN- 27	axe	polygonal a phase with annealing twin	Forging a cast metal plate and subsequent annealing	
FRN- 28	axe	polygonal a phase with annealing twin , Cu_2S	Forging a cast metal plate and subsequent annealing	
FRN- 29	bangle	polygonal a phase with annealing twin	Forging a cast metal plate and subsequent annealing	Brass

dark spots are due to internal oxidation. A small amount of oxygen was detected by EDS from this sample. This object was also made by forging a cast metal plate and subsequent annealing.

FRN-9: a bangle (Figure 10.3(a))

This object was made of brass. Figure 10.3(b) shows that the microstructure consists of a polygonal α-phase with annealing twins. This object was so severely corroded that even grain boundary corrosion can be observed. This bangle was also made by forging of a cast metal plate and subsequent annealing.

FRN-11: a rod (Figure 10.4(a))

This rod was made of copper containing sulfur and iron as impurities. As seen in Figure 10.4(b), the microstructure consists of a polygonal α-phase with annealing twins. The small dark gray spots correspond to Cu2S inclusions. This rod was made by forging of a cast metal plate and subsequent annealing.

FRN-12: a rod (Figure 10.5(a))

This rod was made of copper containing a fairly large amount of arsenic. As shown in Figure 10.5(b), the matrix is a polygonal α-phase with annealing twins. The dark grey regions are possibly oxidized areas. This rod was also made by forging of a cast metal plate and subsequent annealing.

FRN-20: a bangle (Figure 10.6(a))

This bangle was made of copper containing a fairly large amount of arsenic and a small amount of sulfur and iron. As shown in Figure 10.6(b), the matrix is a polygonal α-phase with annealing twins. This bangle was made by forging of a cast metal plate and subsequent annealing.

FRN-23: a bangle (Figure 10.7(a))

This object was severely corroded. It was made of copper containing a fairly large amount of arsenic and a small amount of sulfur. As shown in Figure 10.7(b),

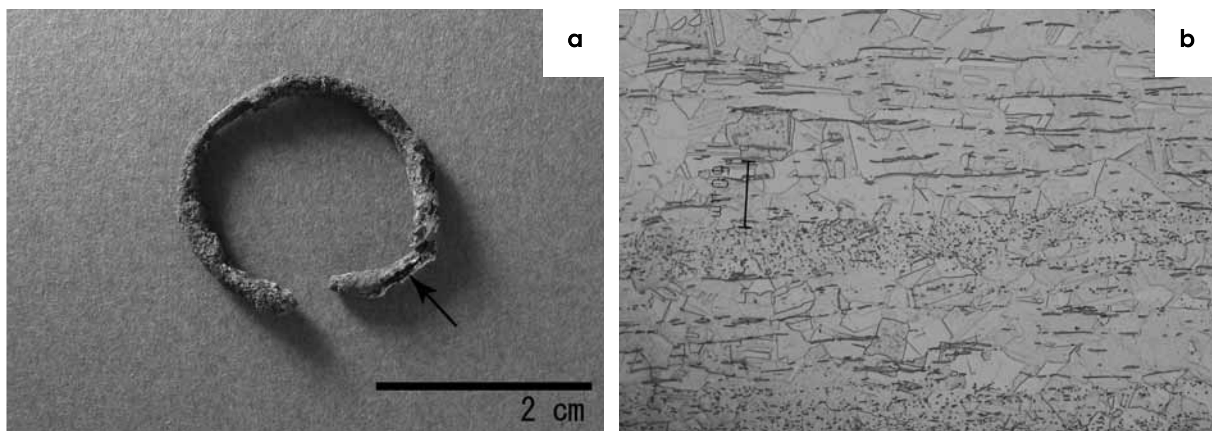


Figure 10.1 (a) Ring (FRN-6) and (b) microstructure

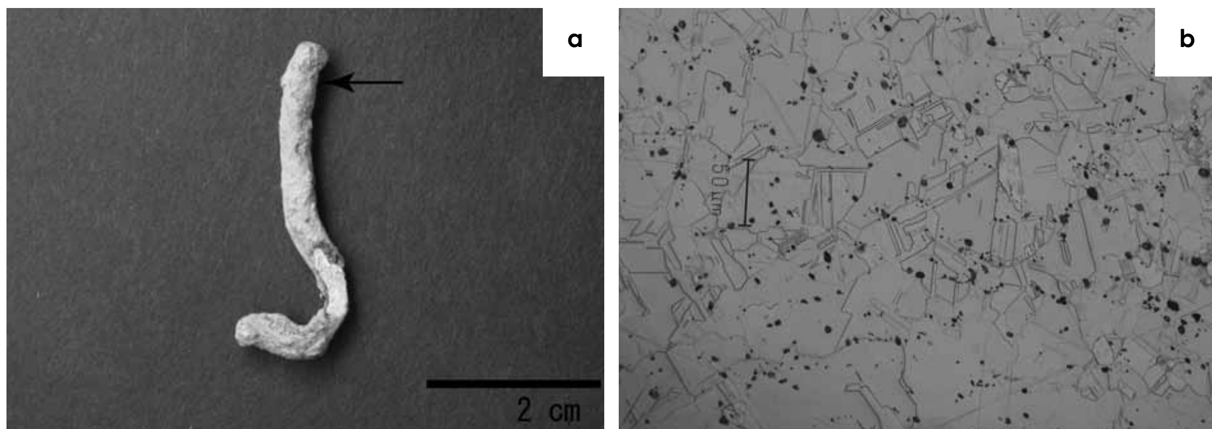


Figure 10.2 (a) Fishhook (FRN-8) and (b) microstructure

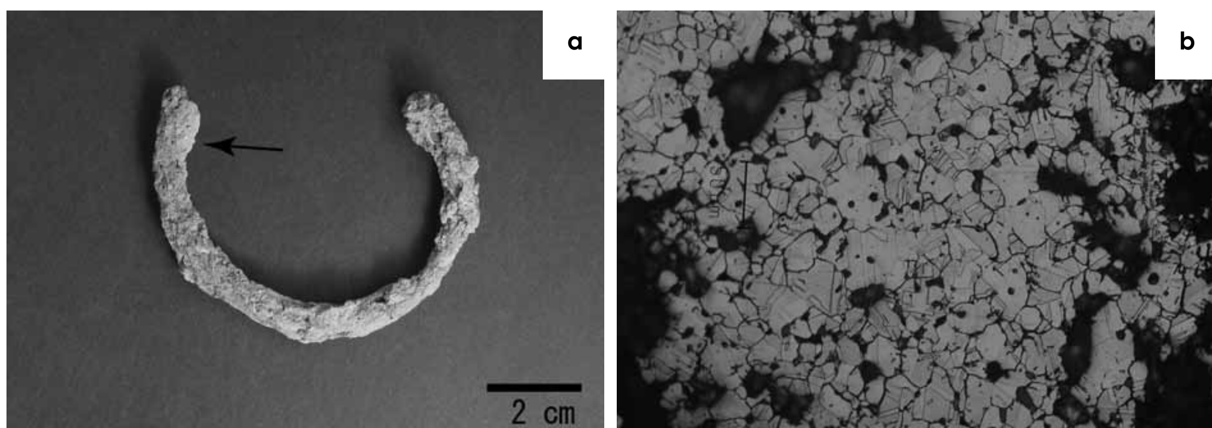


Figure 10.3 (a) Bangle (FRN-9) and (b) microstructure

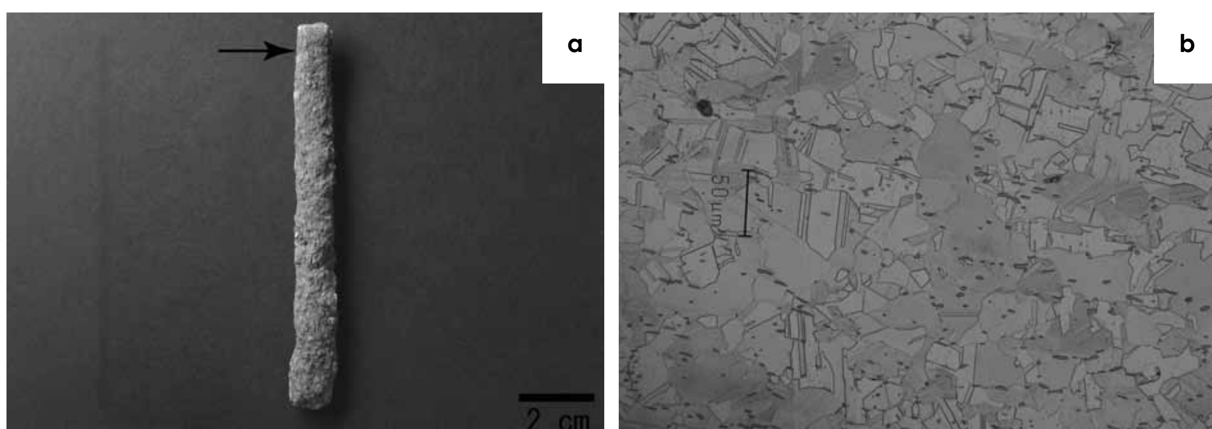


Figure 10.4 (a) Rod (FRN-11) and (b) microstructure

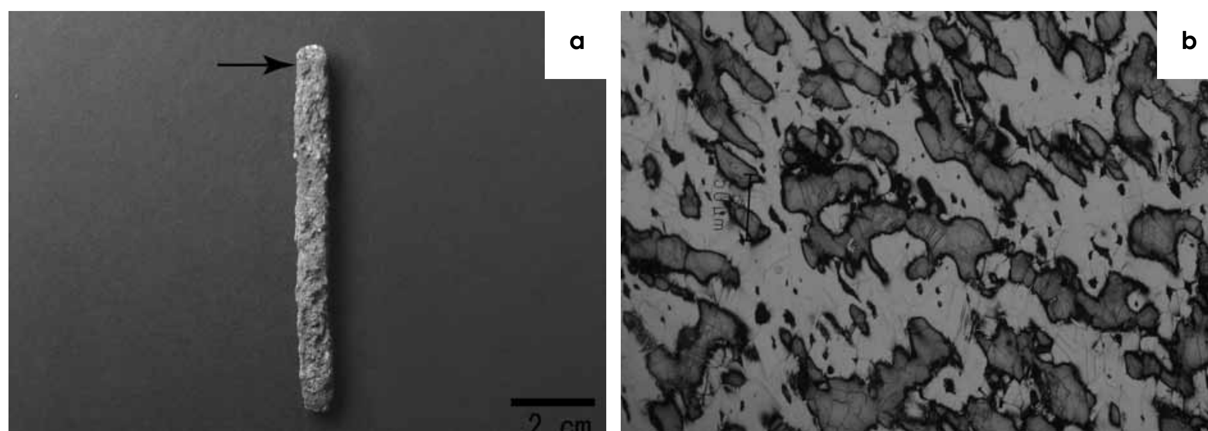


Figure 10.5 (a) Rod (FRN-12) and (b) microstructure

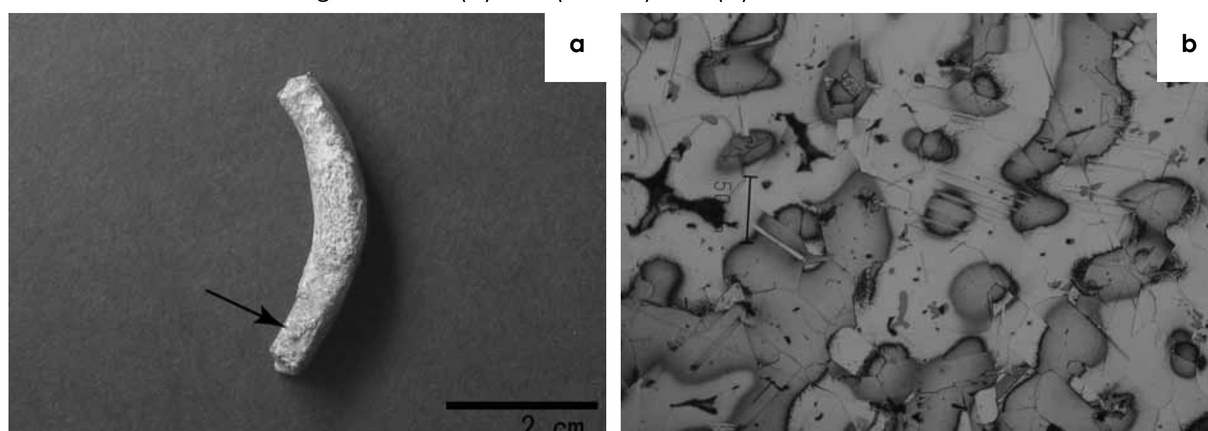


Figure 10.6 (a) Bangle (FRN-20) and (b) microstructure

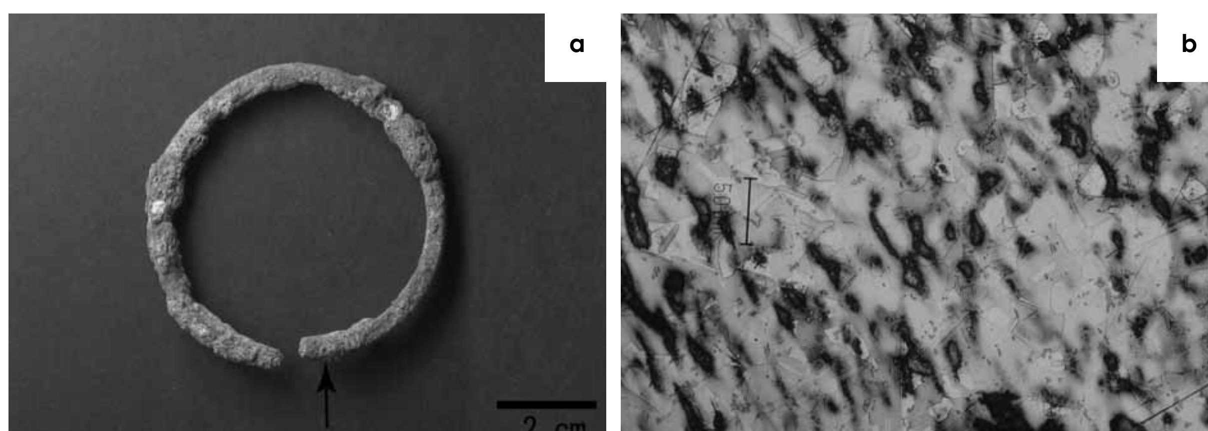


Figure 10.7 (a) Bangle (FRN-23) and (b) microstructure

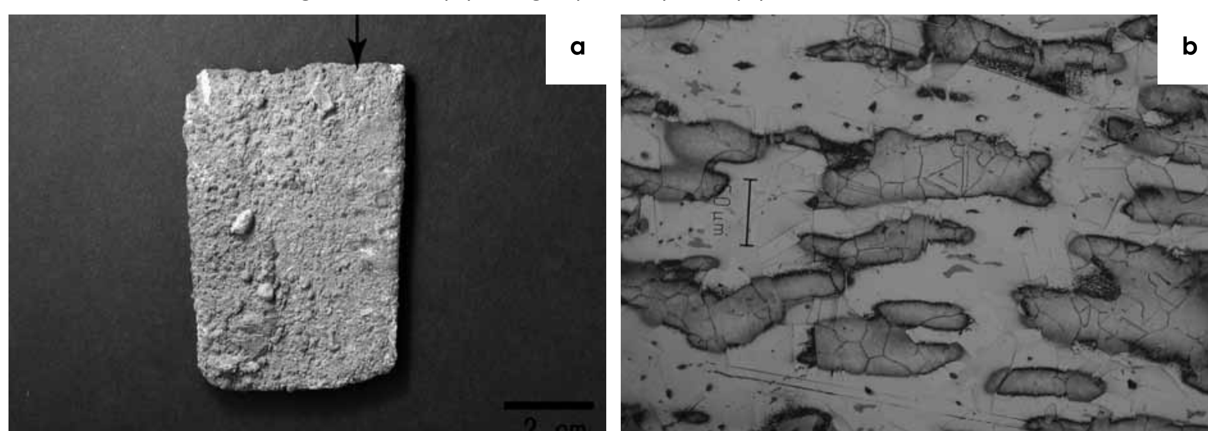


Figure 10.8 (a) Axe (FRN-27) and (b) microstructure

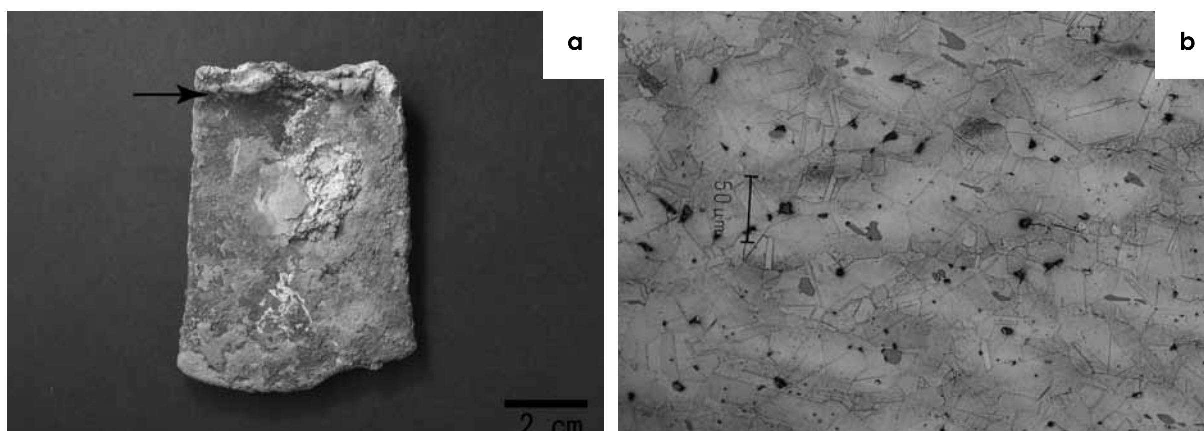


Figure 10.9 (a) Axe (FRN-28) and (b) microstructure

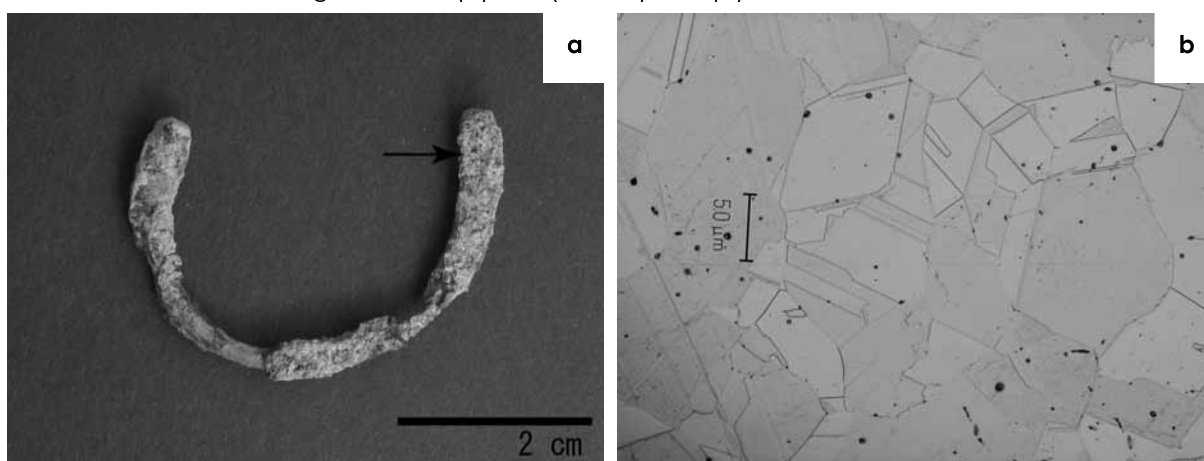


Figure 10.10 (a) Bangle (FRN-29) and (b) microstructure

the matrix is a polygonal α-phase with annealing twins. This bangle was also made by forging of a cast metal plate and subsequent annealing.

FRN-27: an axe (Figure 10.8(a))

This object was made of copper containing arsenic and nickel. As shown in Figure 10.8(b), the matrix is a polygonal α-phase with annealing twins. This axe was made by forging of a cast metal plate and subsequent annealing.

FRN-28: an axe (Figure 10.9(a))

This object was made of copper containing a large amount of arsenic and with sulfur and iron impurities. As seen in Figure 10.9(b), the matrix is a polygonal α-phase with annealing twins. This axe was made by forging of a cast metal plate and subsequent annealing.

FRN-29: a bangle (Figure 10.10(a))

This object was made of brass. Figure 10.10(b) shows that the microstructure consists of a polygonal α-phase with annealing twins. This bangle was made by forging of a cast metal plate and subsequent annealing.

5 SUMMARY

A study was carried on copperware objects excavated at Farmana Khas in northern India. Although they were severely corroded, 22 samples were obtained for chemical composition and 10 for microstructural observations. Most of the objects were found to be made of copper containing sulfur, iron and arsenic. Two of the objects were made of brass. All were produced by forging of a cast metal plate and subsequent annealing.

Acknowledgement

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CHAPTER 11

ARCHAEOBOTANY AT FARMANA: NEW INSIGHTS INTO HARAPPAN PLANT USE STRATEGIES

by Steven A. Weber, Arunima Kashyap, and Laura Mounce

1 INTRODUCTION

By around 2600 BC, a highly organized, economically centralized and culturally integrated civilization had emerged in the northwestern part of South Asia. The Indus Civilization flourished in part due to its successful agricultural practices. To date, our knowledge of these agricultural practices is based primarily on an archaeobotanical record that relies almost entirely upon seed grains preserved through carbonization (Fuller and Madella 2002; Weber 2003). Further, fewer than 50 Harappan sites have been extensively or intensively sampled for archaeobotanical remains. The focus of this limited and biased study has been largely on cereal grains and pulses from Southwest Asia. Further skewing our understanding of Harappan plant use strategies is the fact that only few of the many ecologically distinct regions of this civilization have been adequately studied. To help fill in some of these gaps, an archaeobotanical project was initiated at the site of Farmana, located in the Ghaggar valley region of Haryana, India.

Our approach at Farmana was to incorporate multiple threads of evidence to get a clearer picture of the full range of plants being used at the site. The goal was to use the more traditional approach of carbonized seeds to identify general cropping patterns while using starch grains to identify direct evidence for human consumption and understand patterned relationships between plants and material culture.

Direct evidence of plant use, whether recovered from human remains or the surfaces of implements used for food processing, cooking, serving and storage, is significantly limited or missing from Harappan archaeobotany. As a result, certain questions have not been addressed, such as whether similar types of cereal grains, like wheat and barley were being used and processed differently, and whether certain food plants were associated with status or ritual. The lack of such direct evidence has also impeded our ability to identify patterned relationships between plants and material culture, for example, whether distinct foods were associated with specific ceramic vessels or tool types, and whether shifts in pottery style reflect shifts in plant taxa. The starch grain analysis at Farmana is allowing us to address these issues, as well as unambiguous demonstrate human consumption of specific plants.

The following paper will initially summarize independently our three distinct avenues of research, the ethnobotanical and experimental, macrobotanical and microbotanical. Although each of these approaches and subsequent data sets can stand on their own and will eventually be published independently, they supplement each other nicely and together form the basis of our interpretation of plant use at Farmana. As the analysis of some of the data is continuing, the results and discussion presented here may eventually need revising.

2 STATUS OF HARAPPAN ARCHAEOBOTANICAL RESEARCH

Archaeobotany is best seen as a sub-specialty of archaeology concerned with reconstructing diets, inferring how plants were obtained and used, and describing changes in agricultural and dietary strategies over time (see: Hastorf and Popper 1988; Gremillion 1997; Pearsall 2000; Weber 1999, 2003; Fuller 2002). The archaeobotanical record of the Harappan civilization is for the most part based on macrobotanical data collected from fewer than 50 Harappan sites (Kajale 1991; Fuller 2002; Fuller and Madella 2002; Weber 2003). While at most of these sites the archaeobotanical material recovered was accidental finds representing less than 50 seeds (Weber 1991, 1992), there are a few examples where large, systematically collected and intensively sampled strategies were employed (Weber 2003). From these sites no more than 100 different species have been identified, of which few were found regularly in large concentrations within a single site. Fewer still occurred regularly from site to site, let alone throughout a given region (Fuller and Madella 2002). Cereals, especially "big cereals" such as wheat and barley have been most widely reported. The "small cereals" like millets and pulses are generally only recovered where flotation has been practiced (Weber 1992, 1998; Fuller and Madella 2002). Other types of crops, including fiber and oilseeds producing plants (cotton, linseed and sesame) and roots and tubers (ginger, turmeric and yams) have rarely been recovered at Harappan sites (Fuller and Madella 2002). Tropical fruits (natives such as mango, jamun and amala) and spices (such as black pepper, nutmeg, cinnamon, clove and asafetida), which might have been a part of the Harappan diet (Kenoyer 1998), are also minimally represented or missing from archaeobotanical record.

All agricultural models for the Indus civilization have been derived from this limited database. These include ideas about how agriculture and cropping strategies influenced Harappan culture and culture change (Kajale 1974 Costantini 1985; Saraswat 1986; Possehl 2003), and theories that there was a shift to multi-cropping during the Indus civilization (Jarrige 1985; Meadow 1989, 1996). Additionally, the proposition that the introduction of new species from other regions played a prominent role in changing the settlement system (Possehl 1986), or that the shift towards more localized cultural units and away from urban complexes was associated with, or even stimulated by, a "revolution" in agricultural resources and techniques (Jarrige 1985; Possehl 1986; Meadow 1996). The problem with these studies is that the sites they reference were excavated at different times using different methods, collection and analysis strategies, and were overly dependent on macrobotanical remains preserved through carbonization.

Over the last few decades, microbotanical analysis, such as starch grain and phytolith studies have become increasingly valuable in balancing the record. Archaeobotanists are using starch grain and phytolith analysis to identify early agriculture, distinguish between wild and domesticated species, differentiate the plant organs producing the microfossils, reconstruct the long distance movements and adoption of plants and past environments, and associate plants directly with human activity by recovering the microfossils from lithic tools, ceramics and even human and animal teeth (Atchinson and Fullagar 1998; Banks and Greenwood 1975; Boyadjian *et al.* 2007; Kashyap 2006; Cortella, and Pochettino 1994; Crowther 2005; Esau 1965; Fullagar *et al.* 1998; Loy 1994; Loy *et al.* 1992; Pearsall *et al.* 2004; Perry 2004; Perry *et al.* 2006; Piperno 2000, Torrence and Barton 2006; Reichert 1913; Zarillo and Kooyman 2006; 2008; Henry *et al.* 2007; Piperno and Dillehay 2008; Kashyap and Weber 2010a, b, c). However the systematic study of these plant microfossils for archaeological purposes is still limited in India. Few microfossil studies have been done (for

example phytolith studies by Eksambekar *et al.* 1997; Eksambekar 1999; Madella 1995, 2003 and starch analysis by Kashyap 2006) and very little attempt has been made to compare the two forms of analysis.

Extensive models have been developed to explain the agricultural diversity and productivity of the civilization (see: Meadow 1996; Weber 1999, 2003; Fuller and Madella 2001). The common thread in these approaches is their focus on levels of precipitation by distinguishing regional moisture patterns and their impact on crop selection. As a result, two agricultural strategies are often proposed. One strategy, the rabi, involves crops sown in the autumn, harvested in the spring, and fed with winter rains. This strategy was most common at Harappan sites found in Baluchistan, Bannu Basin, Sindh, Punjab, Swat and Kashmir. Many of the winter crops, including wheat, barley, oats, peas, and lentils were introduced into South Asia from Southwest Asia. The second strategy, the kharif, centers on crops sown in the summer and harvested in the fall, making use of summer monsoon rains, and includes the cultivation of millets, rice, cotton, dates, and gram. Many of the summer crops were indigenous to the region or were introduced from somewhere else in South Asia. The agricultural strategy in Gujarat, Kutch, Rajasthan, and Maharashtra focused primarily on the kharif season. While both the rabi and kharif strategies were often practiced in the same area, the emphasis was generally on one season based on location. This pattern of dividing regions by agricultural strategies based primarily on cropping continues through the historic record into modern times. The archaeobotanical remains from Farmana imply that the region of the Ghaggar-Hakra of the Indus civilization was multicropped and incorporated both strategies during the Harappan Period, just as we see today.

3 ETHNOBOTANICAL AND EXPERIMENTAL STUDIES

Ethnobotanical

Ethnobotanical fieldwork was conducted in the modern village of Farmana and during January to March of excavation seasons 2008 and 2009. We collected information regarding the kinds of plants being consumed and the preparation of the plants for food consumption. We also collected information on hearth fuel, for both cooking and heating purposes. The informants were mostly females, but in households where men were in charge of buying food and gathering wood for the hearth men were also consulted. Over 15 households were interviewed using a semi-structured questionnaire. While most interviews lasted nearly three hours, in two cases we were invited to stay all day and observe the daily activities around the hearth. The interview questions focused on food plants, cooking practices, and fuel for the hearths. The goal was to better understand the archaeobotanical material being recovered from the Harappan occupation at Farmana. All interviews focused on seven general themes: (1) Who was in charge food preparation and fuel collection; (2) What kinds of foods are consumed and how they were prepared; (3) How much time is spent preparing, processing and cooking food; (4) How many hearths were in the household, what were their functions and where were they located; (5) What were the fuel options, when each type of fuel was used and how fuel was processed and stored; (6) How were hearths maintained. How often was the hearth cleaned and where was the debris deposited; (7) What was fed to the cows and how were dung cakes made, used and stored?

As expected, the data clearly demonstrates that women are mostly in charge of buying and preparing food for the household. Food preparation and cooking for the day are usually done in the morning. The every-day diet includes food crops/

cereals such as wheat (during summer), pearl millet (used along with wheat in the winter), occasionally rice and legumes (Vigna species and Bengal Gram). Vegetables are also consumed depending on what is available in the market and what is being grown in the vegetable backyard garden. Weeds such as 'bathua' (*Chenopodium album*) are also used widely for cooking. Chenopodium is a common weed found in disturbed soils and was present in many flotation samples. Its use as a food at Farmana village helps support the idea that its presence archaeologically may also have been as a food supplement.

A combination of fuel-wood, crop residues, and cattle dung was used for cooking and heating. Woman, children and young adults are usually responsible for collecting the wood. The most common wood types were 'shisam' (*Dalbergia sissoo*), 'kikar' (*Acacia karoo*) and 'kair' (*Acacia chundra*). The use of dung depended on hearth shape, function and what was being cooked. Most households had cattle, which were kept at times within the enclosed living compound. Cow dung was usually piled into an open space in the village with other vegetable material and household garbage. Some of the straw observed in these piles included attached seeds grains. These materials was then mixed into dung cakes and dried for fuel. All households had multiple hearths – at least one was specially used for cooking and another for heating purposes especially heating water used for drinking and for other household chores. Some households had over 13 hearths available for use at any given time. Most hearths were cleaned every 7-10 days.

Experimental

To better understand how cooking and processing techniques affect starch morphology (see microbotanical section of this paper) we have been conducting a series of experiments using clay pots and recipes gathered from our ethnographic research at the village of Farmana. Starches are organic and fragile nature. Thus food processing, preparation and cooking techniques can easily affect starch granules resulting in structural and morphological damage and gelatinization (breakdown of intermolecular bonds of starches) (Babot 2003; Campus-Baypoli 1999; Ratnayake and Jackson 2007; Takahashi and Shirai 1982). This is especially true when water and heat are involved. On the other hand alkali cooking techniques and use of salt and sugar can augment granular stability and increase the gelatinization temperatures, resulting in the survival of starches in the cooking-pot residues. Through experimentation, we are identifying the changes in the starch grain structure and morphology resulting from various cooking practices, and then attempting to identify these markers in the archaeobotanical record.

The cooking experiments have focused on vegetable curries, chutneys, roasting and boiling roots and tubers, making 'kheer' or pudding from rice, wheat pudding, making rotis (flat bread) from wheat flour, and brewing barley. All experiments were conducted in the archaeobotanical laboratory at Washington State University Vancouver (WSUV), with support from the National Science Foundation. The experiments are still continuing with additional support from WSUV. Our experiments with eggplant, ginger, turmeric and mango have all indicated that cooking does cause specific structural and morphological changes in starch granules. Further, the amount of time the plants were cooked, and the material in which the plants were cooked in, directly impact starch preservation (Kashyap and Weber 2010). Since many of these cooking markers (microscopic features) are also present in the macrobotanical samples, Harappan processing and cooking practices may be recognizable. Once the experiments are completed (late 2011) and all the ethnobotanical data is processed and analyzed, a comprehensive publication will be produced.



Figure 11.1 Collecting ethnographic data on plant processing, cooking and hearth use



Figure 11.2 Flotation at Farmana

4 MACRO-BOTANICAL ANALYSIS

While macro-botanical remains typically account for the majority of the archaeobotanical data collected from an excavation, this was not the case at Farmana where a more balanced approach was applied. Carbonized seeds, chaff and charcoal -- the bulk of the macro-botanical materials -- represented only one avenue of research and thus only a portion of the Farmana plant material.

Over a two-year period, during both the 2008 and 2009 field seasons, 143 soil samples were floated for macro-botanical material. A flotation machine was constructed during the 2008 excavation season using an old 50 gallons oil drum. Our design was based on a standard Siraf type machine that used a .5 mm mesh to recover the heavy residue and .1 mm cloth sieve for the lighter plant materials (Williams 1973; Watson 1976; Nesbit 1995). By using a pump and a nearby well we were able to process large volumes of soil on a regular basis. The goal was to systematically collect 20 liters samples from all floor, features and stratigraphic layers. In some smaller contexts, such as features including pits and hearths, however, samples of only several liters were collected. The result was a quantifiable and comparative database.

One hundred and forty soil samples were collected and floated. Five of these samples were collected from the cemetery, the rest from the main settlement mound. The heavy residue from the samples was collected, dried, and sorted at the site during the excavation. Charred bone fragments, beads, small terracotta cakes were common, but very little botanical remains were found. The finds were identified, weighed, and distributed to the various specialists. The light fraction samples were dried and shipped to the archaeobotany lab at Washington State University Vancouver (WSUV). Under a low powered dissecting microscope the seeds, chaff and charcoal were removed for analysis.

The sampling strategy was devised to examine temporal changes in crop use strategies over the occupation of the site. Yet it became evident during the excavation that the site was quite shallow, occupied only during the Mature Harappan Period and was heavily disturbed. Based on the stratrigraphy, ceramics and the carbon (AMS) dates, the site was occupied between 2600 and 2200 BCE. While a number of distinct Harappan phases could be identified, the site was occupied for a relatively short period. As a result we saw little reason to analyze all collected samples. Our goal shifted from understanding change over time to describing cropping and plant use strategies at one point in time. At this point in time, 67 of the flotation samples have been analyzed.

The results from flotation suggest that preservation was an issue. While ubiquity was high, at nearly 97 percent, seed density was relatively low. The average seed density for Farmana was less than 5 seeds per liter of soil. This was significantly below what was observed at the site of Harappa, where it averaged nearly 40 seeds per liter of soil (Weber 2003). The low density at Farmana might be a result of less intense fire exposure leading to fewer seeds being carbonized or a result of the site being smaller with a less dense population. The shallow nature of the cultural deposits and constant impact from later activities may also be an issue. Less than twenty different taxa were represented in the seed record (See Table 11.1). Of these, only 9 were definitively food crops. Like other Harappan sites, cereals made up the majority of the carbonized seeds. The primary cereals were wheat (*Triticum sp*.), barley (*Hordeum sp*.) and several small millets (*Panicum sp*. and *Setaria sp*.). One fragmented rice grain was observed in the upper levels of the site. Its context and the lack of additional grains suggest that rice did not play an important role at Farmana. Seeds from a variety of pulses and fruits were also identified (Table 11.1). Green gram (*Vigna sp.*), horse gram (*Macrotyloma sp*.) and sesame (*Sesamum sp*.) were the most frequently recovered crop seeds after the cereals. It is clear that the cropping pattern for

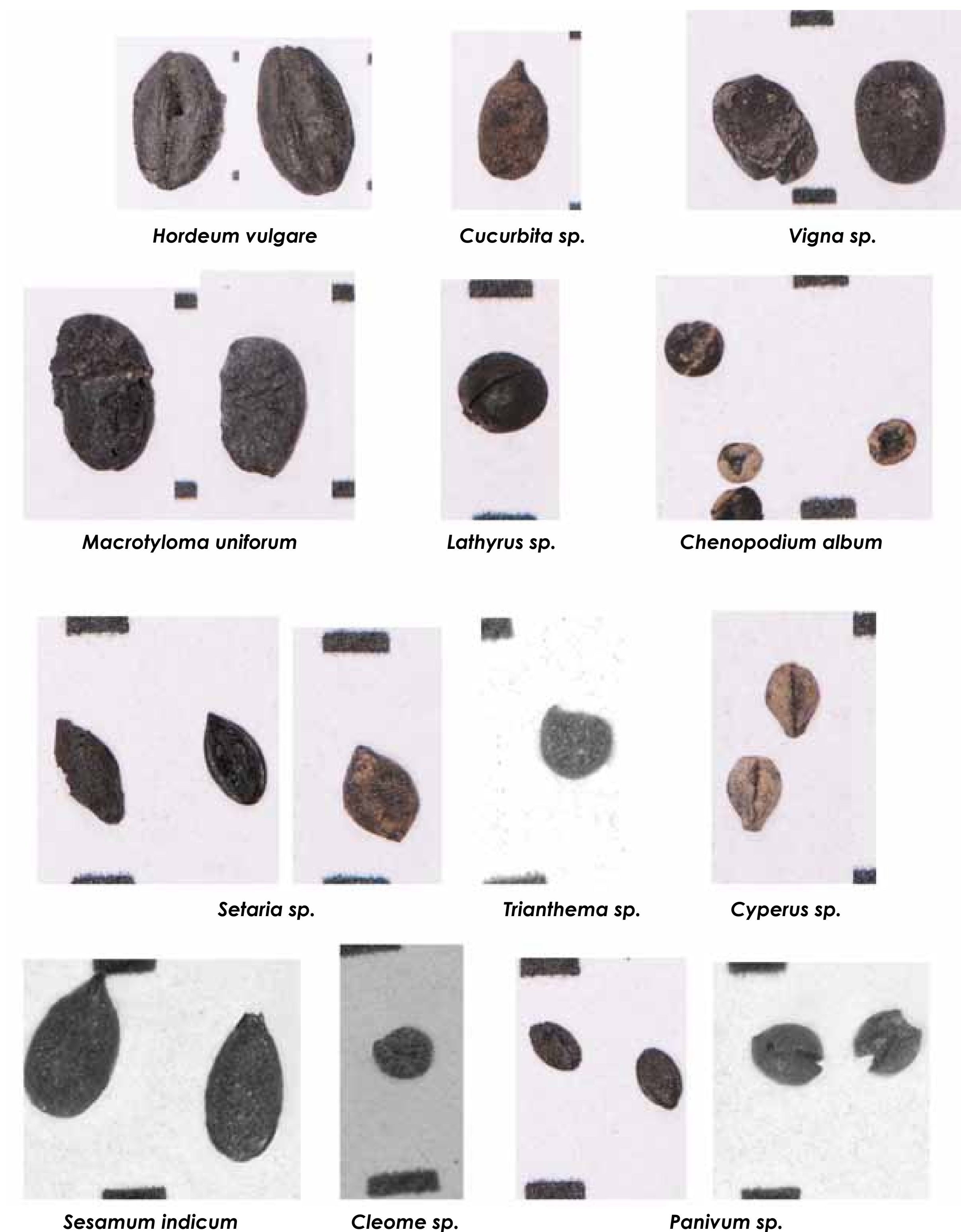


Figure 11.3 Examples of some of the more commonly recovered seeds from Farmana
For scale, the marks in each picture correspond to 1mm



Figure 11.4 Cloth fragment from Farmana

Farmana was one based on both summer and winter watered crops.

The few flotation samples collected and analyzed from the cemetery area contained few seeds. As a result we focused our attention on the settlement area. Two trenches from the settlement area, 1D5 and 1C11, represented the least disturbed sequences and contained the best-preserved macro-botanical material. Efforts to identify shifts in cropping were primarily based on material from these trenches. Because of the narrow time framework, less than 400 years of occupation, and the disturbed nature of many of the sequences, we compared the earliest levels of occupation (Phases 1 and 2), with the later levels (Phases 4 and 5) to get some sense of cropping shifts occurring at Farmana. Using this framework we then compared the ubiquity and seed density of the winter and summer cereals (Table 11.2). The ubiquity of samples with wheat and barley grains declined from 61 percent to 20 percent while their seed density declined from an average of 1.5 to 0.7 seeds per liter of soil. Together, the implication is a dramatic decline in winter cereals. In contrast, the summer cereals had only a minor decline in ubiquity and a slight increase in seed density. Over all, the implication is that there was not only a decline in seed crops but a shift in seasonal emphasis from a winter based strategy to one more equally dependent on both seasons.

Charcoal and chaff were also collected from the flotation samples. Charcoal, a good indicator of climate, is still being identified. Preliminary analysis has led to the identification of two species, *Tamerix sp*. and *Salvadora sp*. Both are typical of a thorn forest with semi-arid trees and shrubs. Chaff made up a very small portion of the macro-botanical material either due to issues of crop processing or preservation. A single carbonized fragment of what appears to be a garlic clove (*Allium sp*.) was also recovered.

One of the most interesting finds at Farmana was a very small fragment (1 mm) of woven plant material

Table 11.1 Plant taxa identified at Farmana. Species identification was not always possible. In such circumstances, the remains were categorized by family.

	Macro-botanical	Micro-botanical
CEREALS		
Hordeum vulgare (hulled barley)	S	
Hordeum sp. (barley)	S	T
Triticum aestivum (bread wheat)	S	
Triticum sphearococcum (dwarf wheat)	S	
Triticum sp. (wheat)	S	
Panicun sumatrense	S	
Panicun sp.	S	T, L
Brachium rumosa	S	
Setaria sp.		T
Sorghum sp.		L-?
Oryza sativa	S-?	
PULSES or VEGETABLES		
Vigna sp. (gram)	S	T
Vigna radiate (green gram)	S	
Solanum sp. (eggplant)		L, P
Macrotyloma sp. (horse gram)	S	T, P
Lens culinaris (lentil)	S	
Latherus sp.	S	
FRUITS, OIL SEED or FIBER		
Cucurbita sp.	S	L-?
Mangifera sp. (mango)		L
Sesamum indicum (sesame)	S	
Linum sp. (linseed)	S	
Unknown	F-?	
SPICES, HERBS		
Allium sp. (garlic clove)	V-?	
Zingiber sp. (ginger)		P
Curcuma sp. (turmeric)		P
OTHER		
Cyperus sp.	S	L
Dioscorea sp.		L
Rumex dentatus	S	
Aegilops sp.	S	
Abutilon sp.	S	
Cleome sp.	S	
Chenopodium album	S	
Chenopodium sp.	S	
Trianthema portulacastrum	S	
Trianthema triquetra	S	
Tamerix sp.	C	
Salvadora sp.	C	
Unknown	S	

S=Seed C=Charcoal Clove=V Fabric=F ?=Possible But Fragmented
T=Starch on Teeth L=Starch on Stone P=Starch on Pottery

Table 11.2 Seed rates for Farmana cereals

		Seed Density	Ubiquity
Winter Cereals			
	Early Levels	1.5	61
	Late Levels	0.7	20
Summer Cereals			
	Early Levels	0.6	38
	Late Levels	0.7	30

(Figure 11.4). The cloth fragment was recovered from the lower levels of Trench 1D5 and appears to date to around 2500 BCE. While the cloth fragment is still being analyzed, it appears to be made of either jute or hemp.

5 MICRO-BOTANICAL ANALYSIS

Two types of micro-botanical data were available at Farmana, starch grains (complex insoluble carbohydrates) and phytoliths (opal silica bodies). Although starch grains and phytoliths have been studied for nearly two centuries, the systematic study of these plant microfossils for archaeological purposes dates only to the last few decades (Esau 1965; Reichert 1913; Schleidon 1849). Increasingly, archaeobotanists are using phytoliths and/or starch grains to identify additional plant species that are not necessarily preserved in the carbonized seed record (Atchinson and Fullagar 1998; Barton *et al.* 1998; Fullagar *et al.* 1998; Hall *et al.* 1989; Kashyap 2006; Loy 1994; Loy *et al.* 1992; Pearsall 2004; Piperno *et al.* 2000, 2004). Our emphasis at Farmana has been on starches, which were successfully recovered from a variety of surfaces and were well preserved. Our starch analysis is still continuing but should be completed in late 2011.

Starch Grains

Starch grains are complex insoluble carbohydrates that serve as the plant's principal food storage mechanism. They have distinctive features (size, shape and structure) that are genetically controlled and, when carefully studied, can be used to identify plant taxa (Banks and Greenwood 1975:242; Cortella and Poschettino 1994: 172; Hardy *et al.* 2008; Loy 1994: 87-91; Reichert 1913: 165; Zarrillo and Kooyman 2006: 484).

In the last two decades starch grain extracted from various archaeological contexts has become a very useful and widely applicable technique around the world for studying direct evidence of plant use and consumption. Starch-grain analysis has been used to study plant diet and use, plant domestication, cultivation and processing, food preparation, ceramic residue analysis, tool use and site organization in various parts of the world (Atchinson and Fullagar 1998; Babot and Apella 2003; Barton *et al.* 1998; Fullagar *et al.* 1998; Henry and Piperno 2007; Kashyap 2006; Loy *et al.* 1992; Perry 2004, 2005; Perry *et al.* 2006; Piperno and Holst 1998; Piperno *et al.* 2000; Zarrillo and Kooyman 2006; Zarillo *et al.* 2008). Starch grains are also increasingly being used as markers of diet (Boynadjian *et al.* 2007; Hardy *et al.* 2008; Henry and Piperno 2007; Piperno and Dillehay 2008). Our starch study at Farmana was the first for a Harappan site. Our goals were to demonstrate that starch grains could be successfully recovered from artifact surfaces, to identify plant-processing activities, and to directly identify dietary practices.

At Farmana we collected samples from 240 surfaces that could be studied for both starch grains and phytoliths. The samples were collected from both the living and cemetery regions of the site. All samples were collected during the 2009 excavation season. These included 54 burial vessels (of various shapes and

Table 11.3 Sample sources for starch analysis

Type of Sample	***Occupational Phase***	***Archeological Context***	***Samples Studied***
Human Teeth	Mature Harappan	Cemetery Burials	9
Pottery Storage or Cooking Pots	Mature Harappan	Habitation Area Floor Trash Hearths Storage areas Structures	20 8 storage pots 8 cooking pots 4 Sherds
Stone Artifacts blades grinders pounders	Mature Harappan	Habitation Area Floor Trash Hearth Storage areas	10 2 lithic blades 4 grinding stone 4 pounders
Sediment Sample or Control Sample	Mature Harappan	Around sampled artifacts	11

sizes and types), 100 ceramic vessels (of various shapes and sizes and types), 30 grinding tools, 16 stone blades, and 40 human teeth/dental calculus.

So far we have studied 50 samples (including human tooth calculus, pottery and atone artifacts) from Farmana (Table 11.1). We sampled nine teeth (1 premolar, 1 molar and 1 incisor) from three human burials belonging to the Mature Harappan Phase at Farmana. In total 20 ceramic vessels or pottery sherds were studied for the pilot project. The analyzed ceramics came from a variety of contexts including mud brick structures, living floors, trash areas and hearths. Studies have shown that food residues most often occur as consolidated and blackened material accumulated on the walls and the base of the ceramic vessels. They also appear in the form of whitish crusts on the exterior of the vessels or charred residues on the work surface of the pottery fragments. The cooking and storage pots were examined very carefully for such residues. Stone implements including two lithic blade tools, four grinding stones, four pounders and the soil sediments adhering to some of these tools were also studied for the pilot project. The stone implements were collected from various contexts (house floors, area around the hearth and other features) at the site. We also studied control samples collected from directly beneath and around the periphery (to a distance of 5-10 cm) of the ceramic and stone implements to assess if non-use contamination may be an issue (Kashyap 2006; Perry 2004; Piperno 2006; Zarillo *et al*. 2008).

For the recovery of the starches from dental calculus we followed the strategy outlined by Piperno and Dillehay (2008: 19626). The sampled teeth were brushed with a soft toothbrush and water to remove adherent soil and other particles. A dental pick was used to scrape different areas of teeth (crown of molars, gum lines etc.) with visible calculus. The extracted residue was directly transferred to a microscopic slide with a few drops of water on it. Before putting on the cover slip, one drop of 50% water/glycerin was added to the residue water suspension to slow the drying of the grains and allows the grains to be easily rotated when encountered

(Piperno and Dillehay 2008). Residues were extracted and processed for starch granules from storage pottery vessels by a multiple-step method that involved successive washes to loosen residue, using a centrifuge to concentrate the residue, and then transferring them to microscopic slide for observation (Piperno 2006). Charred residues were removed with the help of a dental pick from the interior surfaces of the sherds by gently scraping with a sterilized dental pick, pretreated with mild oxidation, and the starch isolated by a heavy-density liquid separation. Residues were obtained and processed for starch granules from ground stones by a multiple step method that involved a fine point needle to loosen residue from cracks and crevices, using a centrifuge to concentrate the residue, and then transferring them to microscopic slide for observation (Piperno 2004). Starch grains were extracted from pounders by shaking them in an ultrasonic bath to completely dislodge adhering sediment and starch. We then isolated the starches by adding a heavy liquid solution.

Starch grains from the soil samples were extracted by using the following method. 2 g of dry sediment was mixed well with Calcium Carbonate and left overnight to settle. This mixture was centrifuged and liquid was poured off carefully. To the mixture a heavy liquid solution was added and it was centrifuged. The supernatant was extracted and centrifuged with reverse osmosis water to get rid of any chemicals. The residue was removed and mounted on to a microscopic slide. The extracts were thoroughly studied with research grade transmitted light microscopy under polarizing lights. Slides were scanned at 200× until the entire area under the glass cover was examined. When a starch granule was located, it was studied under 400×. Each starch grain was rotated using pressure to view all dimensions and notes were taken describing the attributes of the starches for identification purposes. Each starch grain was also photographed. When the examination was complete colorless nail was used to seal the slide and curate for future analysis (Kashyap 2006, Perry 2004).

The identification of the starch granules to plant taxa involved the use of photographs and descriptions as well as comparative starch specimens from modern plants (Kashyap 2006; Perry 2004:1075). The initial step was the identification of the study of the basic morphology of the starch granule. The next step was to note the more detailed characteristics of the granule such as:

1) overall grain type (simple or compound) and shape (bell-shaped, circular, lenticular or oval)
2)contour and surface features,
3)position and form of the hilum (the botanical centre of the grain) and fissure (internal cracks emanating from the hila of some starch grains, formed when the grain begins to grow outward from the hilum and quite literally cracks),
4) number and characteristics of pressure facets present on compound grains,
5) the birefringent or Maltese cross pattern which is clearly visible under polarized light, and,
6)the presence or absence of demonstrable lamellae (rings formed during starch grain growth) (Piperno *et al.* 2004: 672).

Identification was based on a modern reference collection of over 200 different species from 40 families that Dr. Kashyap has put together. In addition, we made use of other databases and plant keys collected and published from other regions of the world (see: Cortello and Pochettino 1994; Henry and Piperno 2007; Piperno *et al.* 2004; Reichert's 1913; Seidemann 1966).

The starch grain research at Farmana is providing the first direct evidence for plants being used, processed and consumed at the site. We have successfully identified starches belonging to barley, small and large millets, and mango from a variety of grinders and pounding stones. Starches of lentils and large and small-grained cereals were recovered from

the interior surface of storage jars, as for example the starch from *Macrotyloma sp*., *Solanum* (cf. eggplant), *zingiber* (cf. ginger) and *curcuma* (cf. turmeric) from a cooking pot or *handi* (a deep narrow-mouthed cooking vessel) (Kashyap and Weber 2010). Our success in extracting and identifying starches in human calculus from burials represents an innovation in South Asian archaeology. The study from 10 different individuals shows that the Harappans had a broad diet which included small grained-cereals, pulses, fruits, vegetables and roots and tubers, with wheat and barley apparently underrepresented in the starches (Kashyap and Weber 2010a) (Table 11.2).

6 SIGNIFICANCE OF FARMANA PLANT DATA

The diet at Farmana appears to have included a variety of crops likely grown locally. Like most Harappan sites, the focus was on cereals and pulses. What is clear is that a combination of indigenous millets and Southwest Asian cereals led to a secure multi-cropping strategy that was in place from the beginning of the occupation of Farmana. This strategy incorporated both summer and winter crops. Rice does not appear to be part of that strategy. With the addition of starch analysis we have an even clearer picture of cropping and diet as a number of species were identified that were not present in the seed record (Table 11.1). Millets, barley and gram were crops that were absolutely being consumed at Farmana as they were found in human dental calculus. Ginger, turmeric, mango, eggplant and possibly sorghum were all identified in the starch record but not found in the seed record. These results clearly demonstrate the need for incorporating different approaches. Independently, the seed grain or a starch grain approach would have missed some species for different reasons. Our study implies that many spices, herbs, fruits and root crops may have played a more important role in Harappan agriculture that previously realized.

Further, specific species correlate well with specific types of artifacts. Eggplant and mango were more often found on long narrow stone blades. Some blades were covered with just eggplant starches and nothing else. In contrast, spices and herbs were only found on the surfaces of ceramics. Different shaped vessels with different design elements seem to be associated with specific plants. At Farmana, we are only just beginning to understand the link between plant use and the material record. Much more work needs to be done along these lines before we truly understand this relationship

Over the short occupation of the site, a cropping shift appears to have occurred. Wheat and barley decline in use by nearly 60 percent while millet use remains constant. The net result is an increasing emphasis on the summer crops. This observed shift in the carbonized seed record may be a result of a number of different natural and cultural processes. The disturbed nature of the site and a flawed sampling strategy could skew our results. Yet the sample was large and diverse enough that any bias should have been accounted for. A change in crop processing methods or locations might also alter the recovery of seed crop. Yet the lack of any significant shift in weed seeds, chaff or seed density would suggest that plant processing was not the cause. A change in climate or specifically a decline in winter rains might be a factor. If a shift in moisture patterns were the sole cause and if the population remained stable, then there should have been an increased presence in summer crops. A slight decline in population associated with a decline in winter rains would account for the shifting seed pattern.

Archaeobotany at Farmana is also contributing to our understanding of Harappan plant economy in the Haryana region. Other sites in the region, like Balu, were successfully sampled and archaeobotanical remains were recovered (Saraswat and Pokharia

2002). While the data from these sites are not quantifiable, they do contain many of the same crops. The biggest difference appears to be a greater dependence on wheat, barley and rice than what we found for Farmana. This discrepancy could be the result of sampling, methods of floating or actual difference in crop choice. Because of the limited data set, no real overreaching plant use model has yet been developed for the Haryana region of the Indus civilization.

To adequately understand Harappan cropping and their agricultural strategy, each individual region of the Indus civilization needs to be studied independently. One unique characteristic of the civilization was that it incorporated great diversity in ecology and culture. Soils, climates and moisture patterns differentiate one region from another and subsequently crops varied. As moisture patterns shifted and climates changed, each region adapted differently. In the Haryana region, and at Farmana in particular, people had access to a great variety of both summer and winter crops. As a result, people living in the region might have been better able to adapt to climatic shifts.

7 CONCLUSION

Analysis of the Farmana data is still continuing and will for some time. Nonetheless, enough archaeobotanical data has been analyzed that some important conclusions can be made. First and foremost, the project clearly demonstrates the need to incorporate different archaeobotanical approaches. Seeds, charcoal, starches, and phytoliths represent different parts of a plant, since they preserve differently in the archaeological record, they can help us identify the different kinds of activities during the Indus Valley civilization. Together, a much clearer and broader picture emerges, one in which many of the internal biases of any single approach is nullified. Starch remains from ginger, turmeric and eggplant represent species that would not normally be preserved in the seed record. Ultimately, Farmana starches will allow us to better link plant use to the material culture.

With large volumes of systematically collected and floated soil we were able to identify wheat, barley and millets as the primary cereal crops for Farmana. Over the occupation of the site, the winter cereals declined in importance. Millets remained important and rice never played an important role. This shift may have been a result of changes in the moisture pattern. Specifically, Farmana might have experienced a decline in the winter rains during the later phases.

The distinctiveness of the Farmana data clearly demonstrates that understanding regional and temporal variability is an important key to modeling Harappan agricultural practices. Our tendency to focus on general moisture patterns that impact large regions of South Asia often fails to recognize how local environments and different regional ecosystems determine diverse and distinct agricultural communities. There were many distinct agro-zones during the Indus civilization (Weber *et al.* 2010). Each developed their own unique agricultural strategy and responded differently to changes in climate. With the addition of each individual Harappan site, like Farmana, regional patterns become clearer. It is only after we understand these regional patterns that we can clearly explain the evolution of Harappan agriculture.

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CHAPTER 12

PHYTOLITH ANALYSIS AT THE FARMANA SITE OF THE INDUS CIVILIZATION

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1 INTRODUCTION

The Farmana Site is an important site in the Indus Civilization period (B.C. 2600-1900). It is located in Ghaggar region in Haryana State, northwestern India. Soil samples were collected by the excavators from Trench 2D9 and sent to the Paleo-environment Research Co., Ltd. Phytolith analysis was undertaken for 11 samples (S-28, S-30, S-31, S-32, S-34, S-36, S-38, S-40, S-41, S-42, S-44), collected from sediments belonging to the Indus Civilization period (Figure 12.1).

2 ANALYSIS

The extraction and counting of phytoliths were carried out following the protocol by Fujiwara (1976):

1) Completely drying the samples at 105°C for 24 hours.
2) Adding 0.02 g of glass beads (40 µm in diameter) to every 1 g of a sample, using a digital scale with 0.1 mg precision.
3) Eliminating all organic matter using the electric oven oxidation method (550℃ , 6 hours).
4) Dispersing with supersonic waves (300W, 42KHz for 10 minutes).
5) Eliminating microscopic grains under 20 µm in diameter) by precipitation method, followed by drying.
6) Dispersing in a mounting medium and preparing a microscopic slide.
7) Counting phytolith grains under a microscope.

In the identification process, bulliform cell phytoliths (motor cell silica bodies) were generally targeted. The counting procedure was as follows:

1) Each slide was examined under polarized light at 400x.
2) At least 400 glass beads were counted for each slide.
3) The number of phytoliths per gram was calculated from the number of glass beads counted per gram and the known ratio of phytolith grains to glass beads in the sample.

3 RESULTS

1) Taxa

The results of phytolith analysis are shown in table 1 and figure 1. The micrographs of the main taxa were shown on the plate. The taxa of phytolith identified at the Farmana Site are as follows.

Gramineae:
Oryza sativa, *Hordeum-Triticum* (husk Phytolith), *Phragmite*, *Zoysia*, Paniceae type, Andropogoneae

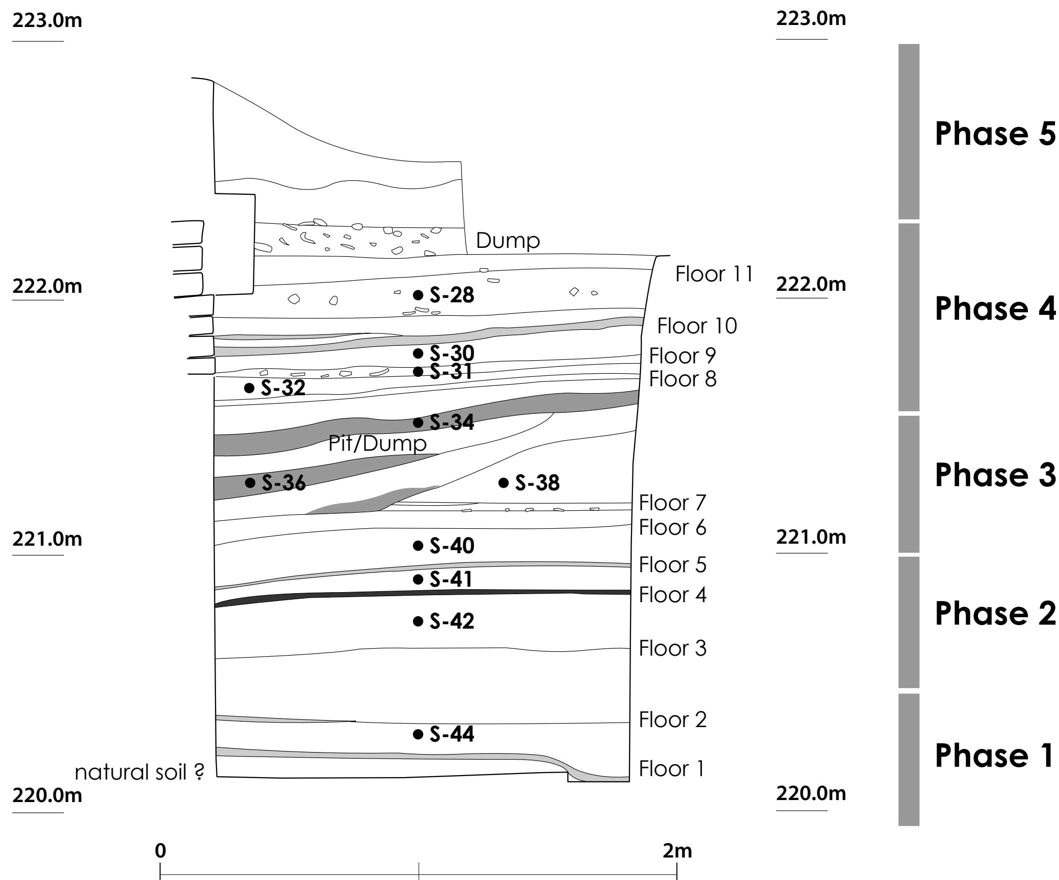


Figure 12.1 Cross-section of Trench 2D9 from which samples were obtained

A type, Andropogoneae B type, Gramineae A type, Gramineae B type, Gramineae C type
Others:
Husk hair origin, rod-shaped, others

2) Quantity of phytolith

Cultivated plants (Gramineae)

Phytoliths from cultivated plants detected at the Farmana Site are as follows: *Oryza sativa* (rice), *Hordeum-Triticum* (wheat and barley; husk phytolith), Paniceae type (including Foxtail millet, etc.).

Phytolith from *Oryza sativa* was detected in 3 samples (S-31, S-34, S-41). The density was 700-1,900 grains/gram, which was smaller than the minimum value of 5,000 grains/gram, used as the criteria for identifying remains of rice paddy fields in Japan.

Phytolith from *Hordeum-Triticum* (husk phytolith) was detected in 4 samples (S-30, S-34, S-40, S-41). The density was 700-2,600 grains/gram, which is relatively low. Distinction of *Hordeum* and *Triticum* is relatively difficult, and therefore, they are reported together as *Hordeum-Triticum* in this report.

Phytolith of Paniceae type was detected in 5 samples (S-34, S-38, S-40, S-41, S-44). The density was 600-700 grains/gram, which is relatively low. Paniceae type includes cultivated plants such as *Setaria italica* (foxtail millet), but at present it is difficult to identify cultivated species based on the form of bulliform cell phytolith (Sugiyama et al. 1988).

Other taxa:

Zoysia, Andropogoneae A type, and Gramineae A type were detected in the most samples, and *Phragmites*, Andropogoneae B type, Gramineae C type were identified in some samples, but the densities of phytoliths were relatively low.

Table 12.1 The results of phytolith analysis at the Farmana Site

Density (×100rains/gram)

	Trench 2D9										
Taxa	S-28	S-30	S-31	S-32	S-34	S-36	S-38	S-40	S-41	S-42	S-44
Gramineae											
Oryza sativa			7		13				19		
Hordeum-Triticum (husk phytolith)		7			7			25	26		
Phragmites	7	7						6			
Zoysia	20	7	7	7	26	7		12	13	7	6
Paniceae type					7		7	6	6		6
Andropogoneae A type	20	14	14	13	33		15	6	45	22	6
Andropogoneae B type	7	14									
A type	13	7	14	33	52	35		12	39	45	25
B type	7		7								
C type		7						12	13		
Others											
Husk hair origin	7		7	7	20			12	71	15	6
Rodshaped	54	28	48	74	98	28	22	75	221	52	18
Others	100	119	137	74	137	84	52	112	123	119	129
Sponge spicules			7	7	7	14		6	13		6
Total of Phytoliths	234	211	240	207	392	155	97	281	578	260	196

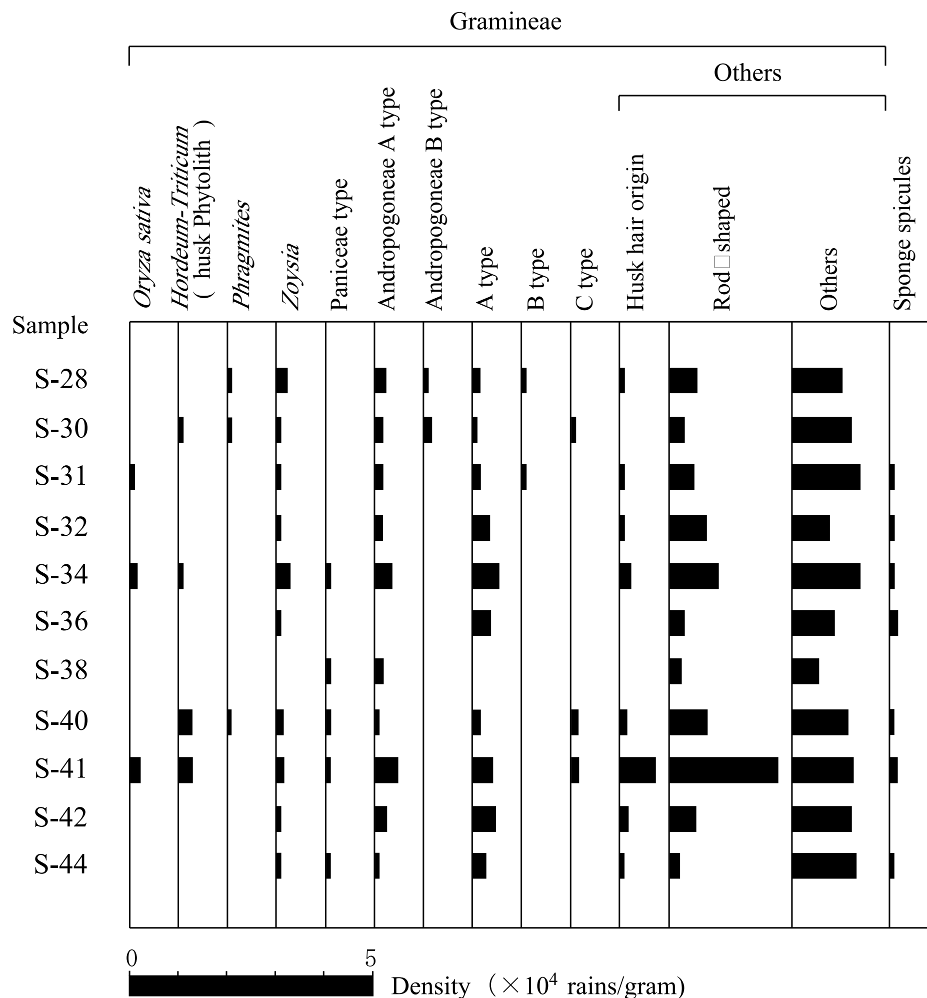


Figure 12.2 The results of phytolith analysis of Trench 2D9 at the Farmana Site

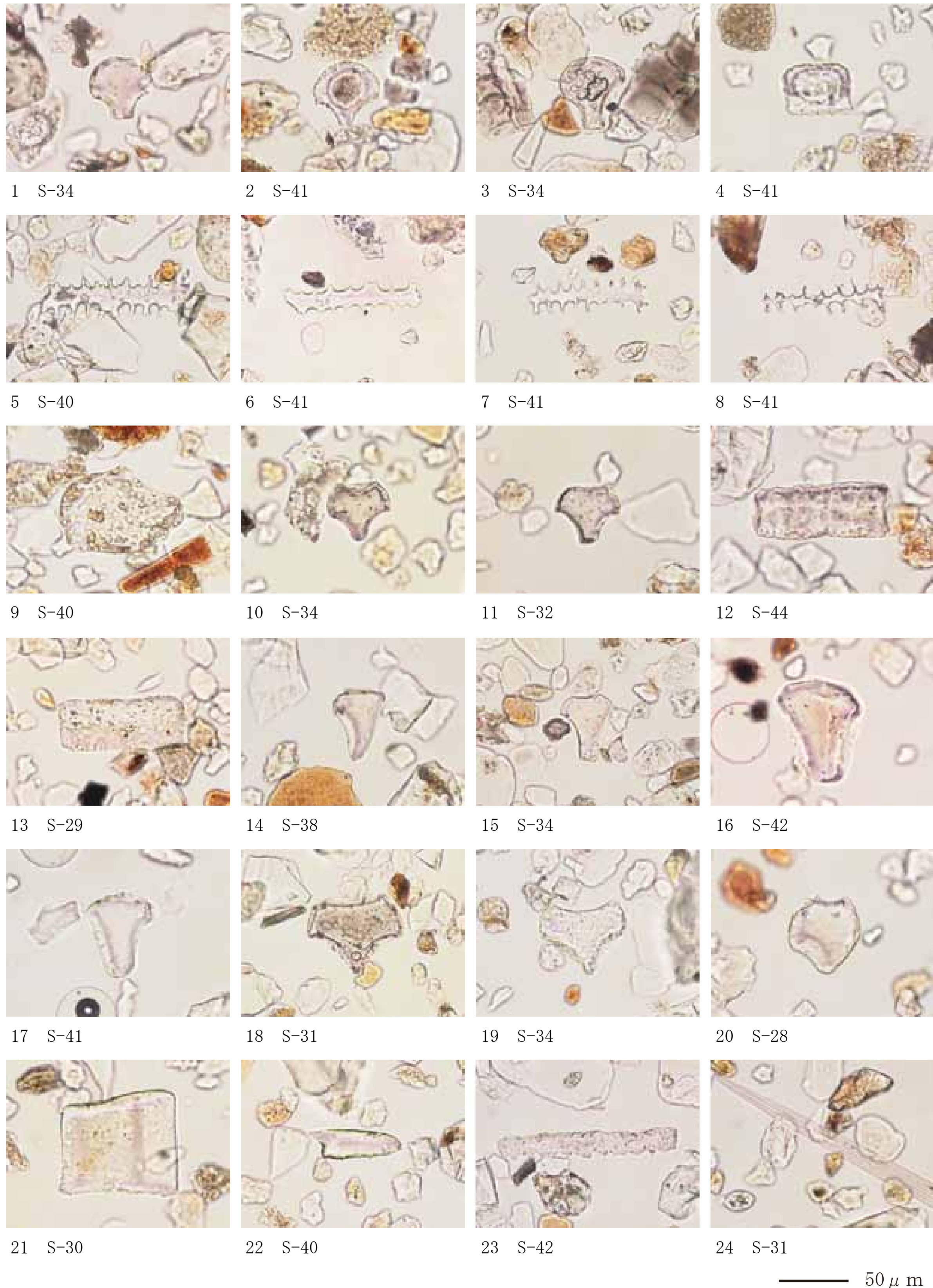


Figure 12.3 Micro-photographs of phytoliths

1-4 *Oryza Sativa*, 5-8 *Hordeum-Triticum* (husk Phytolith), 9 *Phragmites*, 10-11 *Zoysia*, 12-13 Paniceae type, 14-15 Andropogoneae A type, 16-17 Andropogoneae B type, 18-19 Gramineae A type, 20 Gramineae B type, 21 Gramineae C type, 22 Husk hair origin, 23 Rod-shaped, 24 Sponge spicules

4 CONCLUSIONS

As a result of phytolith analysis at the Farmana Site, *Oryza sativa* , *Hordeum-Triticum*, and Paniceae type were detected from more than one sample. Therefore, it is inferred that rice, wheat and barley, and some kind of Paniceae plants (e.g. foxtail millet etc.) were cultivated around the Farmana Site in those days.

In addition, gramineous herbs such as *Zoysia* (turf), Paniceae, Andropogoneae, *Phragmites* (reed) were detected. These plants are not adapted to forest understory, so the area is inferred to have been relatively open, not enclosed by forest, allowing these plants to grow freely. It is also inferred that *Phragmites* (reed) was brought from a damp ground around the Farmana Site.

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CHAPTER 13

AMS RADIOCARBON DATING

BY PALEO-LABO AMS DATING GROUP

1 INTRODUCTION

This report shows the results on radiocarbon dating of samples from Farmana site using the AMS (Accelerator Mass Spectrometry) technique.

2 SAMPLES AND METHODS

Table 1 shows the data of sample and pre-treatment.

Pre-treatments for AMS measurements were performed at Paleo-Labo and 14C concentrations were measured with Paleo-Labo AMS system (Compact AMS, NEC, 1.5SDH).

Conventional radiocarbon ages were determined from the 14C/12C ratios after normalizing the isotopic ratios of 13C/12C to δ13C = -25.0 per mil and then calibrated to get calendar ages.

3 CALENDAR AGE CALIBRATION

Radiocarbon age is not equivalent to calendar age because of isotope fractionation, changes of 14C density in atmosphere caused by changes of cosmic ray intensity and geomagnetic field in the past, and the difference between Libby`s half-life 5568 years and practical half-life 5730±40 years. In order to convert radiocarbon age to calibrated calendar age, we performed calibration of radiocarbon age.

Calibration was performed with the software OxCal4.1 (Data set : IntCal09) and the range of calibrated result was calculated with the probability method of OxCal4.1. The 1σ range corresponds to 68.2% confidence limits for 14C dating error and the 2σ range corresponds to 95.4 % confidence limits either. In Table 2, the percentage in parentheses presents that calibrated results are in the range with the probability. The underlined range is the most probable range. In Figure 1, the curve on the vertical axis presents probability distribution of radiocarbon age and the dual curve presents calibration curve.

4 RESULTS

Table 2 shows δ13C values for correction of isotope fractionation, conventional radiocarbon ages which are not rounded for calibration, conventional radiocarbon ages which are rounded, and calibrated results. Figure 1 show the calibrated results.

Conventional radiocarbon age presents years before AD1950. Radiocarbon age was calculated with Libby`s half-life 5568 years. Errors (±1σ) were calculated from statistical errors of 14C counting and standard deviations in the measurements. The range of errors presents that radiocarbon age distributes in this range with 68.2% probability.

Table 13.1　Samples and Pre-treatment

PLD No.	*Sampling site*	*Sample data*	*Pre-treatment*
PLD-9491	Sample no. 07-009 Tr. 03	Sample type: carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-9492	Sample no. 07-010 Tr. 03	Sample type: carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-9493	Sample no. 07-011 Tr. 03	Sample type: carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-12422	Sample no. 08-001 Tr. 1E1 / St.no. 3N	Sample type: carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-12423	Sample no.08-002 Tr. 1E3 / St.no. 30	Sample type: carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-12424	Sample no. 08-003 Tr. 1A3 / Pit no. 1	Sample type: carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-12425	Sample no. 08-004 Tr. 1C1 ＆ 1C2	Sample type: carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-15046	Sample no.09-016 Trench：1C7	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-15047	Sample no.09-017 Trench：1C8-NW	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-15048	Sample no.09-018 Trench：1D5-SW	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-15049	Sample no.09-019 Trench：1D5-SW	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-15050	Sample no.09-020 Trench：1D5	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-15051	Sample no.09-021 Trench：1D5	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-15052	Sample no.09-022 Trench：1D5	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-15054	Sample no.09-024 Trench：1D5	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-15055	Sample no.09-025 Trench：1D9-SE,SW	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-15056	Sample no.09-026 Trench：2D9-SE	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-15057	Sample no.09-027 Trench：2XD3-SW	Sample type: Charred material Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-16340	SampleNo.10-001 Trench: 1C11	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:1N,HCl:1.2N)
PLD-16341	SampleNo.10-002 Trench: 1C11	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-16342	SampleNo.10-003 Trench: 1C11	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-16343	SampleNo.10-004 Trench: 1C11	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-16344	SampleNo.10-005 Trench: 1C11	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-16348	SampleNo.10-009 Trench: 1C11	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-16349	SampleNo.10-010 Trench: 1C11	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:0.1N,HCl:1.2N)
PLD-16350	SampleNo.10-011 Trench: 2D9	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl:1.2N,NaOH:1N,HCl:1.2N)

Table 13.2 Radiocarbon Age and Calibrated Age

No.	*PLD. no.*	*Season*	*Area/Trench/ Feature/ Cultural Period/Phase*	*δ13C (‰)*	*Conventional radiocarbon age (not rounded) (yrBP±1 σ)*	*Conventional radiocarbon age (rounded) (yrBP±1 σ)*	*Caribrated dates*	
							1 σ	*2 σ*
1	PLD-15051	2008-09	Central Area Tr. 1D5 Harappan Phase 2	-25.35±0.22	3923±23	3925±25	2471BC(29.9%)2436BC 2421BC(14.3%)2404BC 2379BC(24.0%)2349BC	2476BC(93.4%)2338BC 2322BC(2.0%)2309BC
2	PLD-15052	2008-09	Central Area Tr. 1D5 Harappan Phase 2	-27.66±0.11	3975±24	3975±25	2561BC(32.5%)2536BC 2492BC(35.7%)2469BC	2571BC(50.3%)2513BC 2503BC(45.1%)2462BC
3	PLD-15054	2008-09	Central Area Tr. 1D5 Harappan Phase 2	-25.56±0.11	3903±23	3905±25	2464BC(43.1%)2401BC 2382BC(25.1%)2348BC	2469BC(89.1%)2335BC 2324BC(6.3%)2301BC
4	PLD-15048	2008-09	Central Area Tr. 1D5 Harappan Phase 3	-27.24±0.11	3901±23	3900±25	2463BC(43.0%)2401BC 2382BC(25.2%)2348BC	2469BC(88.3%)2335BC 2324BC(7.1%)2301BC
5	PLD-15049	2008-09	Central Area Tr. 1D5 Harappan Phase 3	-26.57±0.11	3903±26	3905±25	2464BC(43.3%)2401BC 2382BC(24.9%)2348BC	2470BC(86.9%)2332BC 2326BC(8.5%)2299BC
6	PLD-15050	2008-09	Central Area Tr. 1D5 Harappan Phase 3	-26.20±0.12	3903±23	3905±25	2464BC(43.1%)2401BC 2382BC(25.1%)2348BC	2469BC(89.1%)2335BC 2324BC(6.3%)2301BC
7	PLD-16340	2008-09	Central Area Tr. 1C11 Harappan Phase 1	-24.19±0.12	3851±20	3850±20	2401BC(8.9%)2382BC 2348BC(50.2%)2283BC 2249BC(8.0%)2233BC 2217BC(1.0%)2215BC	2459BC(10.4%)2417BC 2410BC(68.8%)2273BC 2256BC(16.2%)2207BC
8	PLD-16341	2008-09	Central Area Tr. 1C11 Harappan Phase 1	-24.15±0.10	3880±20	3880±20	2456BC(24.3%)2419BC 2408BC(21.8%)2375BC 2368BC(2.8%)2363BC 2354BC(10.6%)2337BC 2323BC(8.7%)2308BC	2461BC(95.4%)2296BC
9	PLD-16342	2008-09	Central Area Tr. 1C11 Harappan Phase 1	-25.06±0.12	3884±20	3885±20	2457BC(25.7%)2417BC 2410BC(42.5%)2341BC	2462BC(95.4%)2299BC
10	PLD-16343	2008-09	Central Area Tr. 1C11 Harappan Phase 1	-14.75±0.14	3939±22	3940±20	2480BC(37.4%)2452BC 2443BC(1.3%)2440BC 2420BC(11.3%)2405BC 2378BC(18.2%)2350BC	2560BC(4.2%)2536BC 2491BC(91.2%)2344BC
11	PLD-16344	2008-09	Central Area Tr. 1C11 Harappan Phase 1	-24.79±0.15	3893±20	3895±20	2459BC(41.8%)2398BC 2384BC(26.4%)2346BC	2466BC(85.9%)2332BC 2326BC(9.5%)2299BC
12	PLD-16349	2008-09	Central Area Tr. 1C11 Harappan Phase 1	-27.89±0.12	3903±21	3905±20	2463BC(42.3%)2402BC 2382BC(25.9%)2348BC	2470BC(90.5%)2335BC 2324BC(4.9%)2307BC
13	PLD-16348	2008-09	Central Area Tr. 1C11 Harappan Phase 2	-27.36±0.12	3926±20	3925±20	2472BC(25.1%)2452BC 2444BC(2.9%)2440BC 2420BC(15.0%)2405BC 2378BC(25.2%)2350BC	2477BC(95.4%)2342BC
14	PLD-12424	2007-08	Central Area Tr. 1A3/Pit 1 Harappan Phase 5	-27.34±0.22	3860±23	3860±25	2453BC(3.3%)2444BC 2438BC(7.9%)2420BC 2405BC(14.4%)2378BC 2350BC(42.6%)2287BC	2461BC(87.8%)2280BC 2251BC(5.7%)2230BC 2220BC(1.9%)2211BC
15	PLD-12425	2007-08	Central Area Tr. 1C1-1C2 Harappan Phase 5	-25.65±0.22	3845±22	3845±20	2396BC(4.0%)2385BC 2346BC(46.1%)2278BC 2251BC(12.9%)2229BC 2221BC(5.2%)2210BC	2458BC(8.0%)2418BC 2407BC(9.9%)2376BC 2351BC(77.5%)2205BC
16	PLD-15057	2008-09	East Area Tr. 2XD3 Harappan Phase 4	-14.73±0.12	4034±23	4035±25	2579BC(18.6%)2561BC 2536BC(49.6%)2492BC	2621BC(95.4%)2476BC

No.	PLD. no.	Season	Area/Trench/ Feature/ Cultural Period/Phase	δ13C (‰)	Conventional radiocarbon age (not rounded) (yrBP±1 σ)	Conventional radiocarbon age (rounded) (yrBP±1 σ)	Caribrated dates	
							1 σ	2 σ
17	PLD-15056	2008-09	North Ex. Tr. 2D9 Harappan Phase 1	-25.98±0.11	3944±23	3945±25	2547BC(1.2%)2544BC 2489BC(44.7%)2455BC 2419BC(8.3%)2407BC 2376BC(14.0%)2351BC	2564BC(9.7%)2533BC 2495BC(68.2%)2395BC 2385BC(17.5%)2346BC
18	PLD-16350	2008-09	North Ex. Tr. 2D9 Harappan Phase 2	-24.46±0.13	3868±20	3870±20	2449BC(1.2%)2446BC 2436BC(9.3%)2420BC 2405BC(17.1%)2378BC 2350BC(40.6%)2293BC	2463BC(94.9%)2286BC 2247BC(0.5%)2244BC
19	PLD-9491	2006-07	North Area Tr. 3 Harappan Phase 3	-28.16±0.28	3928±34	3930±35	2475BC(46.2%)2400BC 2382BC(22.0%)2347BC	2560BC(3.7%)2536BC 2492BC(91.7%)2298BC
20	PLD-9492	2006-07	North Area Tr. 3 Harappan Phase 3	-26.48±0.27	3871±34	3870±35	2456BC(19.2%)2419BC 2407BC(17.1%)2376BC 2351BC(31.9%)2294BC	2467BC(88.3%)2278BC 2251BC(5.0%)2229BC 2221BC(2.1%)2210BC
21	PLD-9493	2006-07	North Area Tr. 3 Harappan Phase 2	-25.14±0.19	3938±34	3940±35	2488BC(35.8%)2431BC 2425BC(13.3%)2401BC 2381BC(19.1%)2348BC	2566BC(9.7%)2525BC 2497BC(82.1%)2335BC 2324BC(3.6%)2301BC
22	PLD-15046	2008-09	Central Area Tr. 1C7 Gupta	-25.67±0.11	1484±19	1485±20	563AD(68.2%)604AD	545AD(95.4%)624AD
23	PLD-15047	2008-09	Central Area Tr. 1C8 Gupta	-24.48±0.12	1513±20	1515±20	541AD(68.2%)585AD	442AD(7.1%)484AD 533AD(88.3%)606AD
24	PLD-15055	2008-09	Central Area Tr. 1D9 Gupta	-24.28±0.10	1448±20	1450±20	601AD(68.2%)640AD	575AD(95.4%)648AD
25	PLD-12422	2007-08	Central Area Tr. 1E1 Gupta	-22.86±0.17	1389±19	1390±20	641AD(68.2%)661AD	616AD(95.4%)666AD
26	PLD-12423	2007-08	Central Area Tr. 1E3 Late Medieval	-23.69±0.24	205±18	205±20	1660AD(17.1%)1674AD 1778AD(34.0%)1799AD 1942AD(17.1%)1953AD	1651AD(26.9%)1682AD 1738AD(2.7%)1751AD 1762AD(45.1%)1803AD 1937AD(20.7%)1955AD

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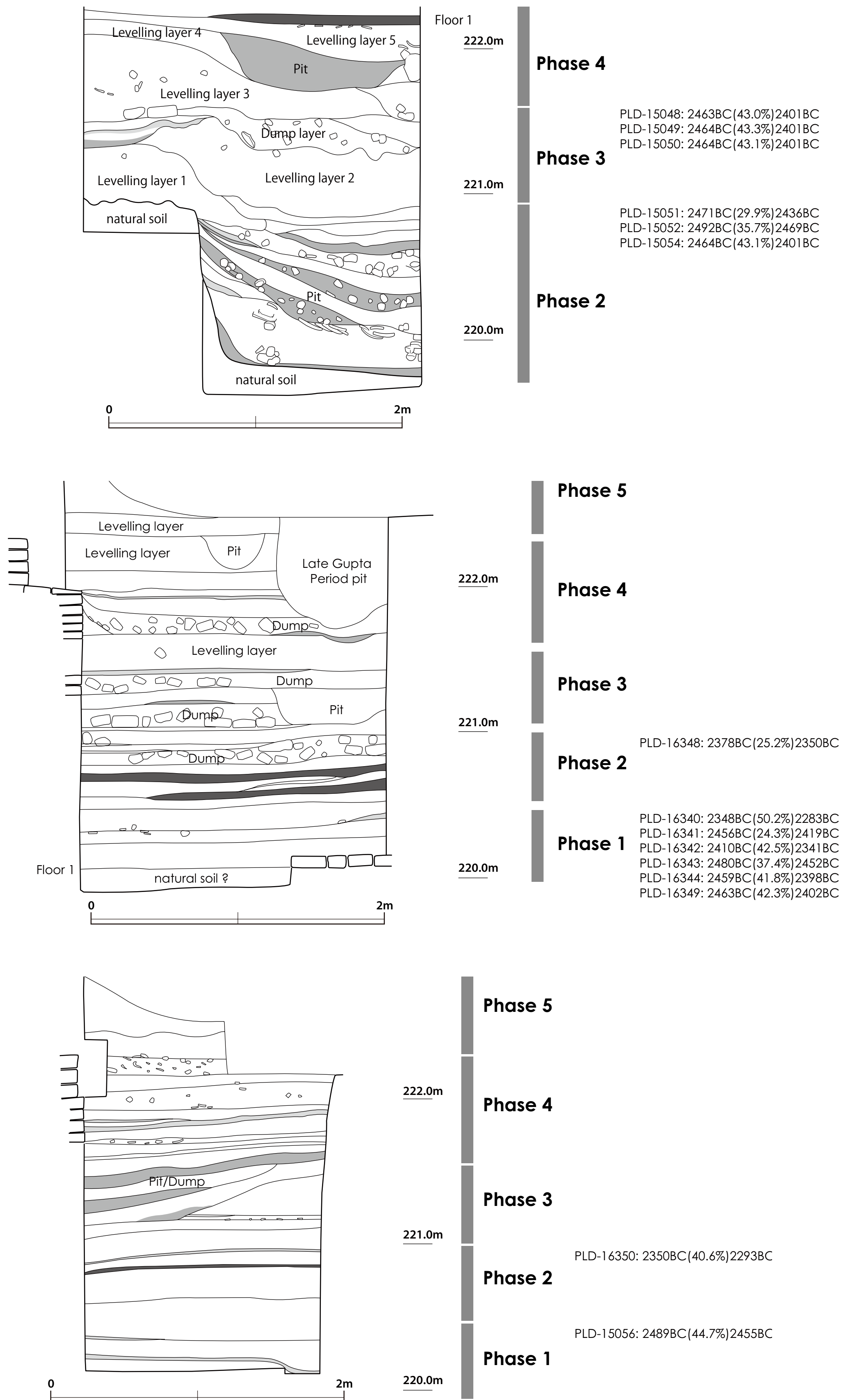


Figure 13.1 Stratigraphic positions of AMS dates in Trenches 1D5, 1C11 and 2D9

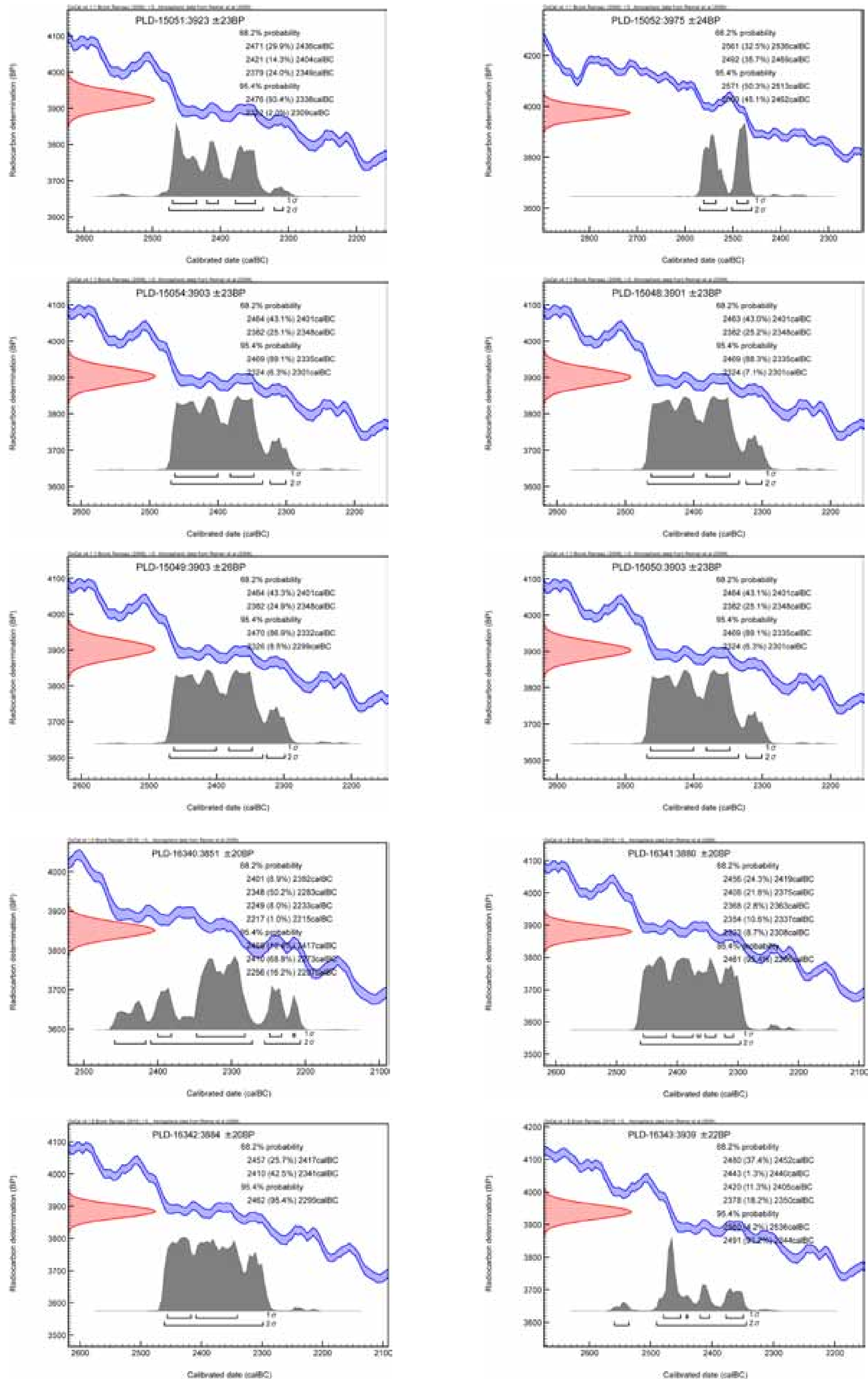


Figure 13.2　Caribration results

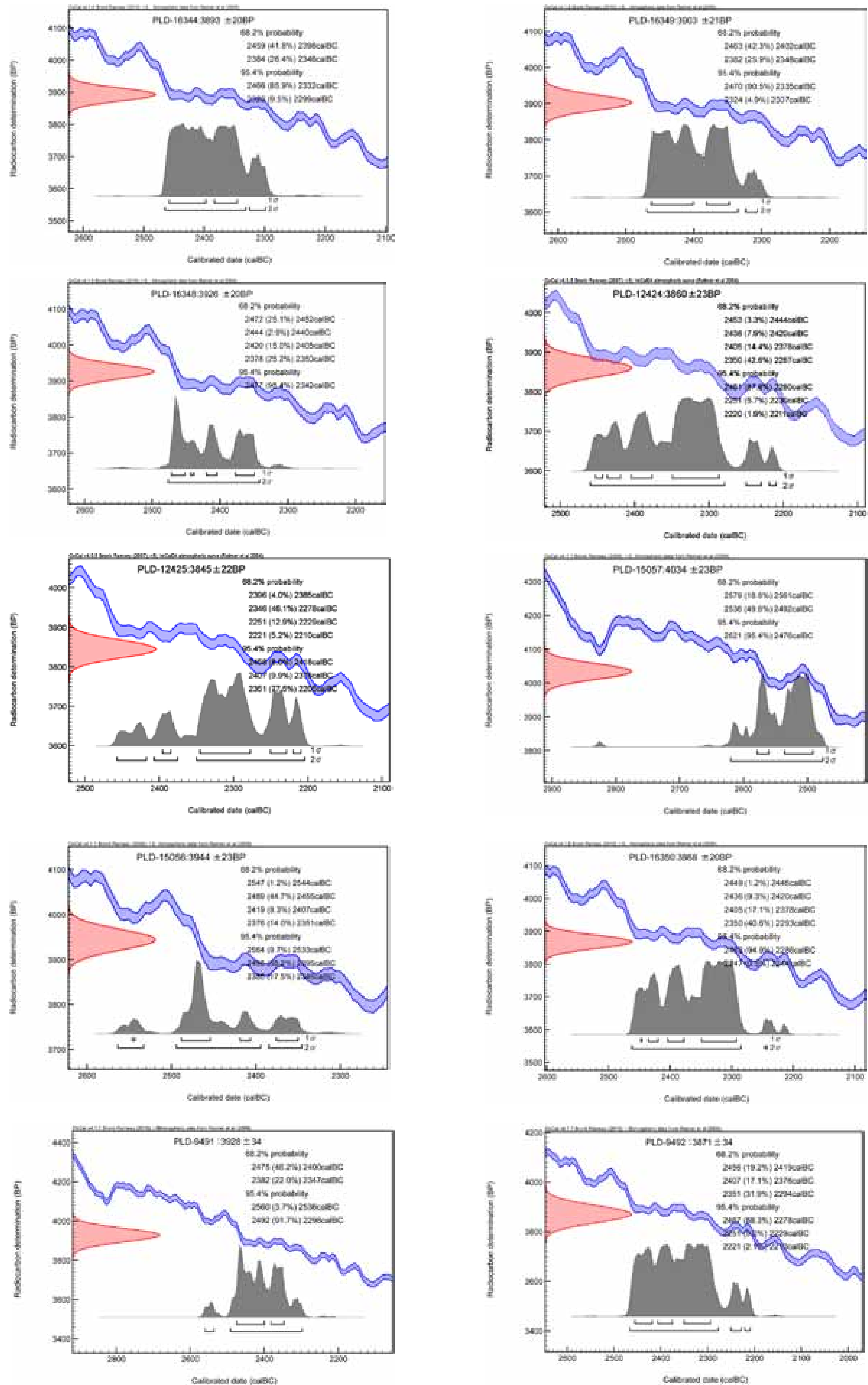


Figure 13.3 Caribration results

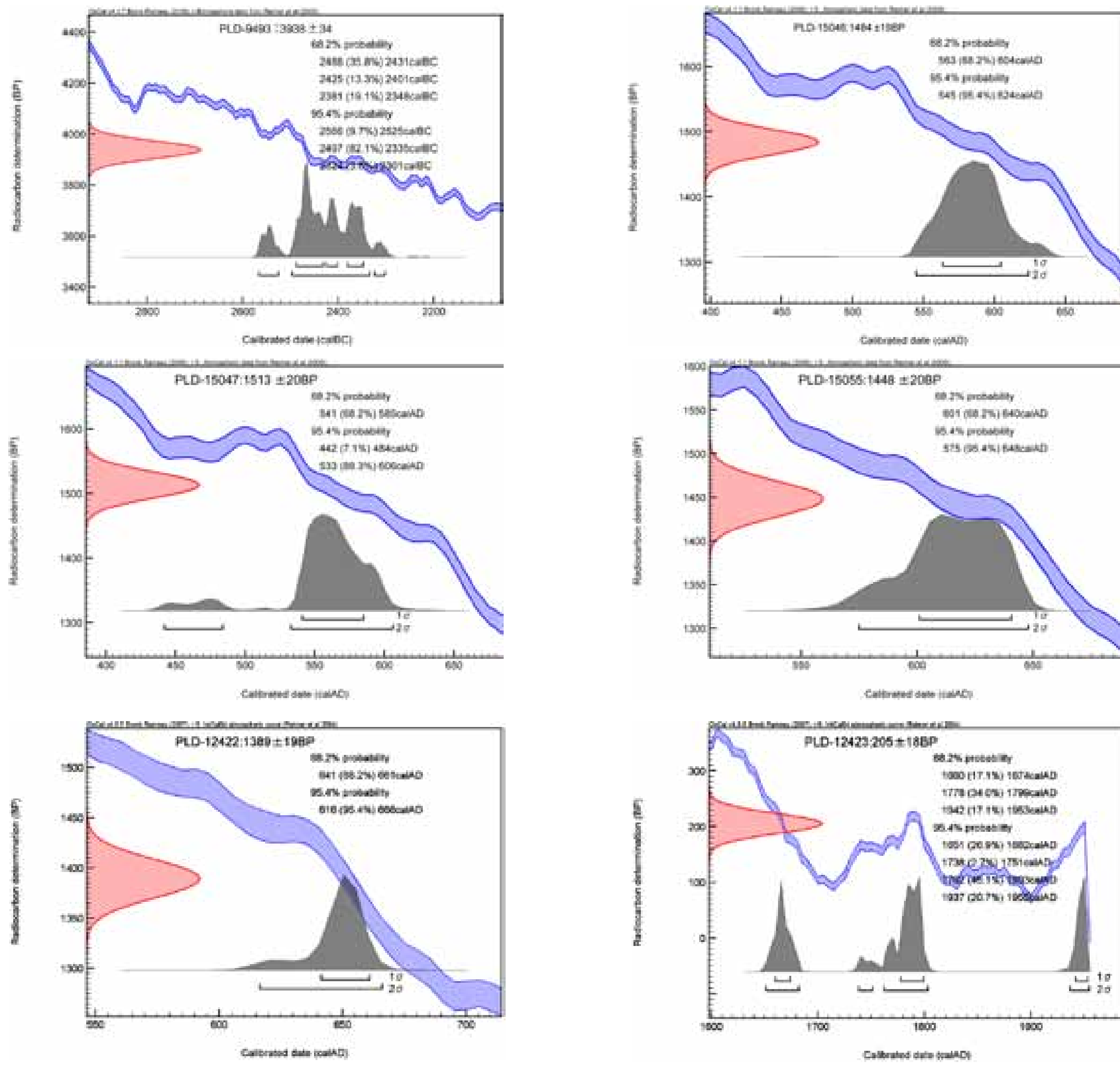


Figure 13.4 Caribration results

CHAPTER 14

SUMMARY

BY TOSHIKI OSADA

In concluding the excavation report of Farmana, the results of the work is to be summarized to prospect the future tasks and works which will surely deepen our understanding on the site specifically and the Indus Civilization as a whole.

The excavations was conducted for three seasons from 2006-07 to 2008-09. Not only the excavations themselves but also post-excavation documentation and analysis of finds have revealed a number of significant facts on the site.

In the excavations, Prof. Shinde directed excavations towards revealing structural remains horizontally in order to understand the socio-economic aspects of the site. He was successful in exposing structure complexes with a number of features which are relevant for evaluating the Harappan sites in the Ghaggar Basin. It is clear on the basis of artefacts and a dozen of AMS C-14 dates that the brick structure complexes belong to the Harappan period. Several phases were ascertained in the development of structure complexes, but the limited excavations of the lower levels still leave some issues to be investigated. While Prof. Shinde places the earliest levels to the 'Early Harappan period' based on his observations, the artefacts, especially pottery coupled with AMS dates from the lower levels point to the 'Mature' Harappan period occupation. However, this does not deny the possibility that the beginning of occupation at the site goes back earlier than the Harappan period. Future tasks should be directed towards revealing the lower levels in order to fully understand the development of the settlement at the site.

Another significant result is the excavations of a number of burials in the Cemetery Area. They are clearly dated to the Harappan period. It should have been closely connected with the development of the settlement. One of the interesting facts of burials, there is a variation in the conditions of skeltons, which Prof Shinde terms primary, secondary and symbolic. Since it is likely that it reflects a complexity of burial customs during the Harappan period, further studies is awaited for better understanding the nature and relationships among burials. Still our understanding of burials is in the initial stage for evaluating the complexity of the cemetery.

The documentation and analyses of enormous finds from the excavations have revealed the potentiality of the site. A. Uesugi worked on pottery from the Settlement Area and the Cemetery Area revealing the ceramic assemblage at the site consisting of the Harappan and Non-Harappan pottery. This may be indicative of the socio-economic structure of the site which was formed by immigrants from western Punjab and local people who had close relations with each other. Although the DNA analysis of skeltons from the cemetery is still in process, further studies certainly reveal many aspects regarding the social structure of the site. It also contribute to our understanding of the Harappan society in the Ghaggar Basin in general.

A. Konasukawa, H. Endo and A. Uesugi contributed a report on the artefacts from the site. A number of typical Harappan traits, such as seals, jewelry, weights, chert blades and so on were discovered from the excavations, clearly telling us that the site was involved in a socio-cultural networks which covered a vast area of the Indus Civilization. It is very important to know that the easternmost area of the Ghaggar Basin was a vital part of the Indus society.

T. Nagae from the University of Toyama kindly prepared a report on the compositional analysis of copper objects from the site. A number of artefacts are waiting for this kind of detailed characterization studies. This kind of analytical studies will provide us with tremendous information on trade networks of the Indus Civilization.

S. Weber, A. Kasyap and L. Mounce gave a report of their work on archaeobotany at Farmana. Various new attempts have been made to fully understand the dietary aspects at the site. Their works certainly contribute to a better reconstruction, not only of the subsistence economy but also of the human-environment relations during the Harappan period. Issues on the climatic changes from the third to second millennium BCE are also subjects of their works.

S. Sugiyama from the Paleo-environment Research Co. Ltd. worked on phytolith found from the soil samples which were obtained from one of the Index Trenches. His analysis has revealed facts both similar and different to/from the Weber's work. Especially the presence of rice in phytolith is important as it was not found in macro-botanical remains. It is important that different approaches reveal different facts.

Paleo-Labo AMS dating group kindly contributed a paper on results of the AMS C-14 dating. The dates indicate that the site was occupied around 2500 - 2400 BC or the early part of the Harappan period. Unfortunately the partial destruction of the sites by villagers for their own agricultural activities may have removed the later occupational levels. Some dates point to the occupation around the sixth century ACE during the Historical period as is also attested in artefacts.

This report aims at providing basic data which we obtained from three-seasons' excavations. Although a number of further works are needed for better understanding the site, this excavation project has certainly been successful as a multidisciplinary project in revealing various aspects of the site and the Indus society and in opening a number of new approaches towards the Indus Civilization studies. As the leader of the Indus Project, I express my gratitude to Prof. Shinde and his team, and a number of scholars from various institutions who contributed to this project with their hard works.